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COMPUTERWORLD

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Promises aplenty as industry leaders ally

Microsoft, Ashton-Tate team up on network DBMS

BY ED SCANNELL
and STEPHEN JONES
CW STAFF

NEW YORK — In an unprecedented display of mutual back scratching, personal computer software giants Microsoft Corp. and Ashton-Tate Corp. said last week they will jointly develop an SQL data base engine for network servers that offers features usually found only on minicomputer and mainframe systems.

SQL Server, which the two companies are developing along with Sybase, Inc., will reportedly reside on an OS/2 server and act as a back-end engine through which data can be stored and retrieved by up to 40 networked personal computer users through SQL commands.

That data can come from any application on the network designed or modified to run under SQL Server's nonproprietary platform.

Developers claimed the high-performance SQL engine will allow networked PCs to carry out jobs that now require larger multiuser systems. The product will include features common to those environments, such as true multiuser capabilities, distributed data base functions and transaction-processing features like security and rollback and recovery.

A retail version of the product will hit dealer shelves during the second half of this year and carry a price tag of $1,500 to $3,000, said Ed Esber, chairman of Ashton-Tate.

May firm up PC standards

Although Ashton-Tate and Microsoft have long been expected to butt heads in the PC data base management system market, analysts said the cooperative effort

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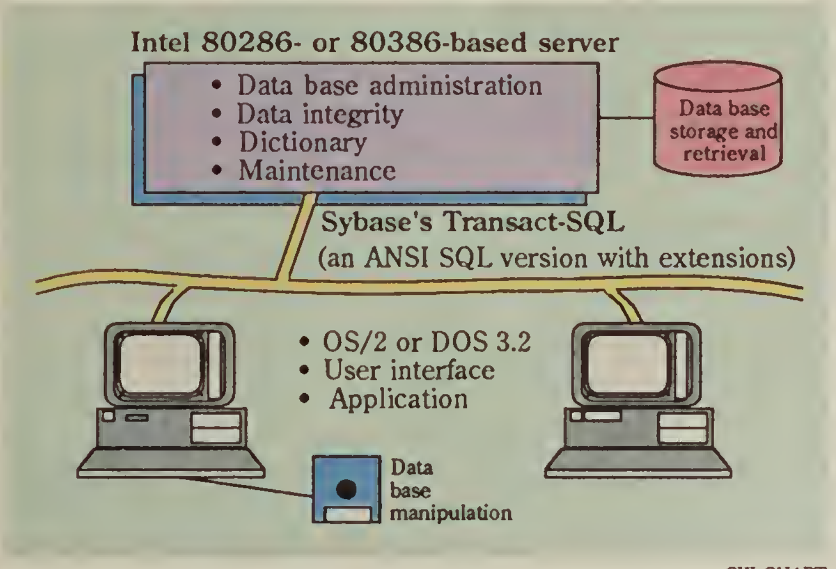
Their serve

Data base server combines Sybase SQL expertise with Microsoft operating system and LAN technology to allow single-user data base front end to manipulate back end



CW CHART

Users wait on SQL pledges

BY ED SCANNELL
CW STAFF

ANALYSIS

Most large corporations have not implemented a definite microcomputer-based SQL strategy, despite the fact that crucial products from IBM and Microsoft Corp. are only a few months away from release. It may be destiny that SQL will play a significant role on corporate microcomputers, but the technology is still wending its way along technology frontiers.

Joint agreements such as the one signed last week by Microsoft and Ashton-Tate Corp. should help clarify for many MIS managers the shape and direction micro-based SQL technology will take.

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It's official: DEC and Apple in joint project

BY JULIE PITTA
and PATRICIA KEEFE
CW STAFF

SAN FRANCISCO — Apple Computer, Inc. and Digital Equipment Corp. last week formally unveiled their long-anticipated plans to jointly develop workstation and connectivity products.

The announcement, though long on rhetoric and short on detail, was characterized as a major coup for Apple, which gains a large-systems partner and increased credibility in the business market.

The deal was also seen as a potential answer to DEC's as-yet-unsuccessful search for a workable low-end strategy.

Specifics sparse

But clouding the announcement was a lack of specifics concerning products, pricing and availability. The agreement was signed the morning it was announced. "It was definitely a rush job," an Apple spokesman said, citing his firm's fears that news of the negotiations was leaking out.

Continued on page 121

MIS dream jobs still elude blacks

BY JEAN S. BOZMAN
CW STAFF

Nearly 25 years after Martin Luther King gave his "I Have a Dream" speech on the steps of the Lincoln Memorial, many black MIS professionals say King's dream of equal opportunity is far from realized.

Among MIS professionals, including programmers, systems analysts, operations specialists and managers, fewer than 7% are black. Blacks and Hispanics together constitute less than 10% of the DP work force, according to the U.S. Bureau of the Census. Blacks and Hispanics represent about 20% of the country's population.

While blacks and other minority groups have been able to gain entry into the MIS field, only a few have climbed to the top of the profession.

John Bennett

'A bit discouraging'

"It is difficult and a bit discouraging to try to get ahead in this business unless you're in a company that has an Equal Employment Opportunity obligation or you're working for someone who promotes on the basis of merit," says John Bennett, the former DP director for United Technologies Corp. and one of the most prominent black MIS executives.

Bennett is currently a senior partner with Mueller and Associates, a Hartford, Conn.-based company which is planning on marketing computer-aid-

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NEWSPAPER
SECOND CLASS

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Alternate routes. A less expensive alternative to routers, LAN-to-LAN T1 bridges are gaining attention from users who want to link geographically dispersed networks. More news is expected at next week's Comnet '88 show in Washington, D.C. Pages 6,7.

Final offer. Prime calls on Computervision once more, this time armed with lawsuits and a $15-per-share offer. Page 121.

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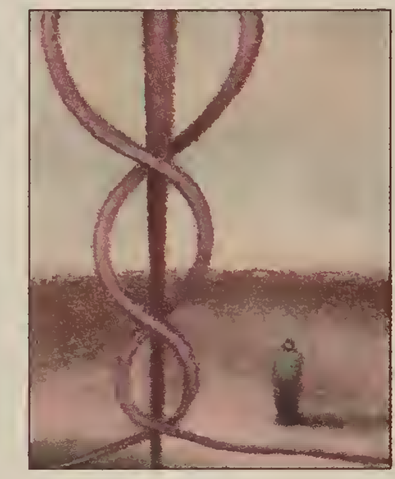

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> *"Computer systems must fit functionally with what the end user does. Ease of use is inversely proportional to the thickness of the user manual."*
>
> DR. HOWARD BLEICH
> BRIGHAM AND WOMEN'S HOSPITAL
>
> *See story page 61.*

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The computer did it!

Program trading bears brunt of crash fallout

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Computerized stock trading, particularly the strategy of portfolio insurance used by a handful of large investors, played a major role in the stock market's October crash, according to a presidential commission.

In an eerie coincidence, the study by the Presidential Task Force on Market Mechanisms was released Jan. 8, the same day the stock market took another plunge that was blamed on program trading.

In the wake of the report, the New York Stock Exchange (NYSE) Friday imposed, for at least one week, restrictions on program trading on any day when the Dow Jones industrial average moves in excess of 75 points. Under those restrictions, which will be evaluated after this week's trading, NYSE member firms are asked not to use a high-speed order-execution system when the market reaches that volatile level.

Program trading has become controversial because it uses computer models to automatically trade large blocks of stocks or futures [CW, Nov. 2, 1987]. One type of automated trading is portfolio insurance, a hedging strategy designed to protect holdings from declining prices by selling stock index futures.

With Wall Street concerned about fundamental U.S. economic problems, portfolio insurers launched a selling spree early on the morning of Oct. 19 that eventually led to a 508-point drop in the Dow Jones industrial average. The market began to rally from its early morning lows, but at midday, "portfolio insurance sales overwhelmed the rally," the task force said.

The portfolio insurance trades depressed the price of stock index futures, which then triggered another type of automated trading, called index arbitrage.

Striking consequences

"The contribution of a small number of portfolio insurers and mutual funds to the Monday [Oct. 19] selling pressure is . . . striking," said the commission, which is chaired by Nicholas F. Brady and known as the Brady Commission.

For example, one portfolio insurer, who remained unnamed, sold stocks and futures valued at $1.7 billion on Oct. 19, the task force said. "Huge as this selling pressure from portfolio insurers was, it was a small fraction of the sales dictated by the formulas of their models," it reported.

The commission did not call for any ban or severe limits on program trading and steered away from blaming computer technology. Instead, the task force urged the Federal Reserve Board to take on the job of regulating the stock, futures and options markets as a single market.

Duo tries to stop Cobol addendum

BY CHARLES BABCOCK
CW STAFF

An advocate of adding addenda to Cobol 85 and a skeptic of the addendum process have joined forces to try to scuttle the attempt to implement early corrections in Cobol 85.

The unlikely allies, speaking out at the same time but for different reasons, are both members of the X3J4 American National Standards Institute committee that drew up Cobol 85.

Lawrence K. Madison, data processing director at Travelers Insurance Co. in Hartford, Conn., said he opposes the second Cobol 85 addendum because adding corrections to the language threatens to introduce incompatibilities after it has become a standard and has gone into use.

"A user designs and develops a system a certain way and then runs the risk that it will not behave the same way when he gets an updated compiler," Madison said. He said regular correction addenda will result in Cobol 85.1, Cobol 85.2 and so on.

Jerome Garfunkel, a Cobol consultant in Litchfield, Conn., invoked a similar reason in a written comment to the X3J4 committee after the panel, in a 12-5 vote, took up the correction addendum during its Austin, Texas, meeting in December.

In his comment, Garfunkel wrote that the addenda process was established to add optional functions, not corrections, to Cobol without changing any parts of the existing standard. The trigonometric functions proposed in Addendum 1 "would introduce no potential incompatibilities into the language" and could be approved without affecting existing users, he noted.

Garfunkel and Madison agreed that the proposed corrections are so minor they would not affect existing users.

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Chen sees wide use of supers

BY JEAN S. BOZMAN
CW STAFF

EAU CLAIRE, Wis.— Steve Chen expects to see within five years wide commercial use of supercomputer architectures like the one he is developing in partnership with IBM, the former Cray Research, Inc. systems designer said last week.

Chen, who is planning to build a parallel processing supercomputer with more than 100 billion floating-point operations per second of processing power, said he expects to downsize the machine for commercial sale to aerospace and automotive users when it is completed in 1992 or 1993.

"The next crop of scientists and engineers will know how to use supercomputer power," he commented in an interview. Chen, who left Cray last fall and founded Supercomputer Systems, Inc. late last year, is collaborating with IBM in the design of Supercomputer Systems' first product, the SS-1.

Until recently, Chen noted, there were fewer than 200 supercomputers in the world, most of which were owned by government agencies and research laboratories. But Chen said he believes smaller modules could not be sold to commercial customers. "When the machine and the technology is ready, we can look into downsizing it into smaller units that won't be as expensive," he said.

Solutions within seconds

Chen said he wants to achieve a qualitatively different kind of supercomputer use. Cray X-MPs, which he helped design, and Control Data Corp. Cyber 205s take many minutes — or even hours — to complete simulations of car crashes and aircraft flights. "We can solve a problem with the X-MP 4 in two hours, but with our [SS-1], those problems will come down to a few seconds," he said.

What the end user will see is an interactive display of SS-1 supercomputer calculations, something not yet achieved on any machine, Chen said.

To build the SS-1, though, will take more than the $100 million budget Chen had planned to spend for the MP, a breakthrough Cray supercomputer. Cray Chairman John Rollwagen scuttled that effort, saying the MP would require costly breakthroughs in physics research.

Supercomputer Systems employs only about 45 people — most of whom are former Cray workers who were involved in the MP project. Last week, Supercomputer Systems named Dean Nordahl vice-president of finance and administration. Nordahl was previously general manager of financial plans and controls for CDC's Data Storage Products Group.

Since Supercomputer Systems is so small, Chen said, he believes the company will be a sort of systems integrator for supercomputer components obtained from others. Chen is looking to IBM for advanced chip technology, discrete components, peripherals and packaging technology. "IBM can provide us with a very advanced chip, with packaging and with substrate," Chen said, adding that he is not yet planning to add IBM's new superconducting substrates to his plans. "We may stretch the technology a little bit, but we do not need to invent something that is already expected to come out in the next two years."

If other parts are needed, Chen said, he will not hesitate to seek other partners for the supercomputer project. However, he said there will be few partners and that each must meet with IBM's approval. "We will sit down and talk about new partners," Chen said, but he rejected the notion that IBM will have veto power.

United embraces PS/2; 9370s take a backseat

BY JEAN S. BOZMAN
and STANLEY GIBSON
CW STAFF

CHICAGO — IBM's Personal System/2 personal computer played a starring role at a press bash put on last week by Covia Corp., United Airlines' information services subsidiary.

The microcomputer stole the thunder — and much of the functionality — from IBM's 9370, which was once expected to be the guest of honor at such a roll-out.

At the 9370's announcement in October 1986, IBM spotlighted United as a key user test site. Later, United became the first 9370 customer, taking delivery of a processor to be used in its Enterprise travel agency management system.

Regarding Covia's subsequent PS/2 focus, John McIntyre, the company's director of product marketing, noted, "We made some significant breakthroughs at the PC level."

A travel agency interface to United's Apollo reservation system, called Focalpoint, took over many features that were meant to be part of the 9370-based Enterprise system, McIntyre said.

"We moved the modules from the [9370] back-room box to the PS/2," McIntyre said. Enterprise, now under Covia's umbrella, was developed by IBM's Federal Systems Division.

McIntyre said an Intel Corp. 80286-based workstation appeared to answer all the major needs of travel agents in connecting to the Apollo system. The 80286-based PS/2 was chosen because of its expected ease of maintenance and because of the options that may be developed in the future from IBM's Micro Channel architecture, McIntyre said.

Focalpoint is based on Microsoft Corp.'s Windows and uses IBM's Token-Ring local-area network.

Covia unveiled a full-fledged travel agency management system based on the PS/2 Models 60 or 80 and called TS2000.

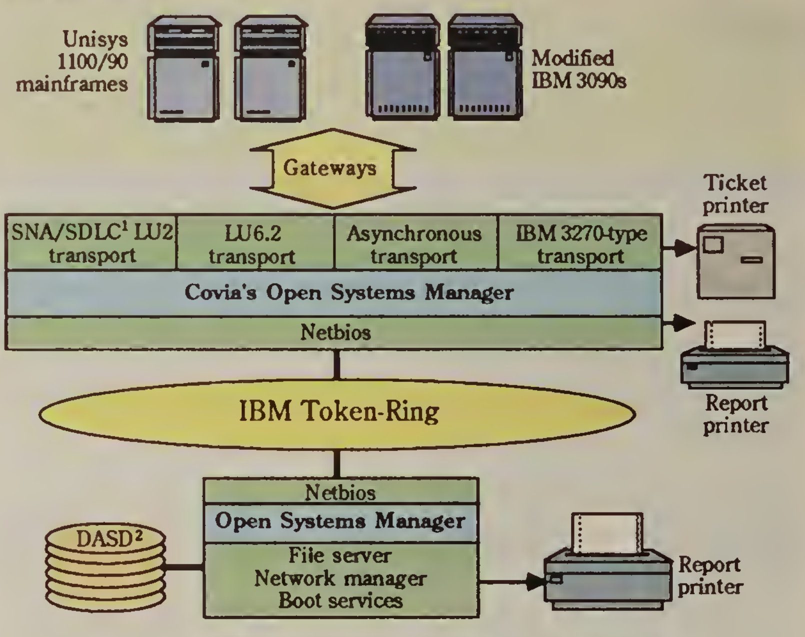
Large firms might require a mid-range computer-based system, which Covia is still developing, McIntyre said. "The package is manufacturer-independent," he said, indicating that IBM's 9370 or 4381 or a non-IBM mid-range processor could be used.

Across the country

Ultimately, Covia aims to put thousands of IBM PS/2 Model 50s and 60s and hundreds of Token-Rings in travel agencies and reservation offices nationwide. Each PS/2 can call up Focalpoint, allowing travel agents to view multiple data bases relating to airlines, rental car and hotel availability. Tying the entire United system together is the Open Systems Manager communications software, a variation on IBM's Netview-based VM/Distributed Systems Node Executive software distribution system.

Friendly ties

United's travel reservation architecture uses most of IBM's communications standards



[1] IBM Systems Network Architecture/Synchronous Data Link Control
[2] Direct-access storage device

CW CHART: FRANK C. O'CONNELL

Additional components of the system are the following:

- IBM 9190s, which are modified IBM 3090 Model 200s, are located at the Apollo system's central computer room in Denver. These 9190s are bound together by a new — and as yet unannounced — IBM high-speed connector. A second mainframe center in the Chicago suburb of Elk Grove Village houses Unisys Corp. 1100/90s used for airline crew scheduling and for tracking arrivals and departures.
- A central command center at Chicago's O'Hare International Airport using 10 miles of IBM Type 2 cable for voice and data transmission across four backbone rings and 23 subrings. Many rings are anchored by a Texas Instruments, Inc. file server. A broadband cable-television system displays television images as well as flight information on 500 of 700 channels.

The O'Hare network runs all operational aspects of United's terminal and public information operation, handling an average of 400 flights per day.

IBM's relationship with the $350 million Covia will be close — but not exclusive, said Covia President Barry Kotar. Covia will design advanced travel and reservation applications for the airline industry and reserves the right to use non-IBM components in its overall systems architecture.

Future decisions on MIS management will be influenced by new partners in Covia, who will own up to 50% of the company. Kotar would not identify which companies are buying Covia shares, but indicated they include other airline carriers.

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Timeplex rolls out wide-area network link

BY ALAN ALPER
CW STAFF

NEW YORK — Staking out a position as a broad-based supplier of wide-area networking gear, Timeplex, Inc. last week introduced a family of packet-switching products to complement its T1 switch product line.

As expected [CW, Jan. 11], Timeplex's Timepac packet-switching family consists of two nodal processors — processing 100 and 500 packet/sec., respectively — and two packet assembler/disassemblers (PAD), one supporting up to eight synchronous devices, the other up to 48 asynchronous devices.

Each PAD allows each device on the network to share two CCITT X.25 links and also supports CCITT recommendations X.3, X.28, X.29 and X.121, the company said.

Breakthrough?

Jeromey Franks, an analyst with the Gartner Group, Inc. in Stamford, Conn., said the Timepac family represents a significant price/performance breakthrough. "The problem has been that you needed to spend $50,000 to get X.25 nodes put in place throughout a network," he said. "With Timepac, it costs considerably less."

The 100 packet/sec. nodal processor lists for $4,990 and is currently available, while the 500 packet/sec. unit is priced starting at $12,945 and will ship in March, the company said. The asynchronous PAD, priced at $1,250, is also available immediately, while the bisynchronous PAD, listing for $4,990, is scheduled to ship in the third quarter, Timeplex noted.

Both processors feature gateways to public X.25 networks and dynamic adaptive routing to take advantage of the most cost-effective communications path. The network automatically reconfigures when a new node is added and bypasses a failed node. All network topologies — including bus, ring, star, tree and mesh — are supported, Timeplex said.

The nodal processors are equipped with integral network management support for diagnosis, accounting and security. Both the nodal processors and PADs can also be managed by Timeplex's network management system, Timeview, the company said.

Timeplex said its Timepac family can be used as the foundation for building both private and hybrid networks.

Industry profits, spirits up at year's end

BY CLINTON WILDER
CW STAFF

On the strength of last week's solid quarterly results from Digital Equipment Corp. and others, the computer industry's financial outlook appeared quite healthy as most major vendors prepare to announce fourth-quarter earnings this week.

DEC's 22% gain in both profits and revenue helped reassure industry watchers concerned about a year-end technology spending drop after the Oct. 19 stock market crash. Tandem Computers, Inc. fueled that fear 10 days ago by announcing that it will not meet its quarterly financial goals; the announcement also ignited a panicky computer stock sell-off and an overall market drop Jan. 8.

DEC's numbers "showed there was no falloff in business near the end of the year, as some had feared," said John Rutledge of Dillon Read & Co. "That's very encouraging and bodes well for 1988."

Boffo numbers

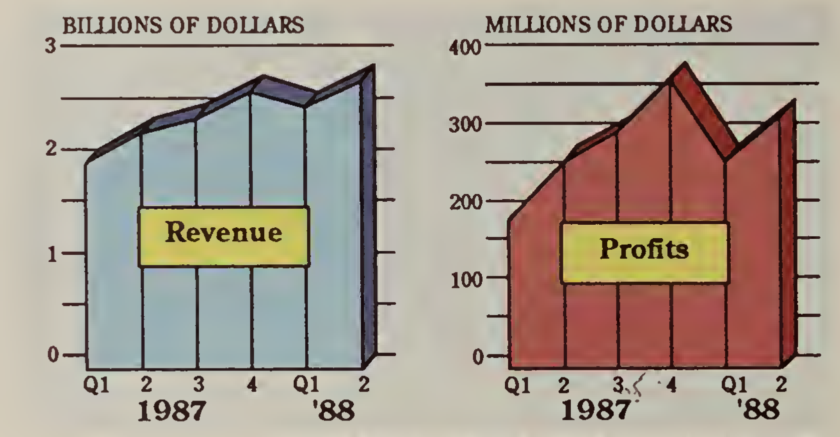
Other vendors that either said they anticipated or had reported strong results in the December quarter included Unisys Corp., Stratus Computer, Inc., Intel Corp., Digital Communications Associates, Inc. (DCA) and Automatic Data Processing, Inc.

DEC reported that second-quarter earnings rose 22% over year-earlier levels to $329.5 million, or $2.48 per share. Sales were $2.78 billion, up from $2.27 billion a year earlier. The company said its profits were aided by strong overseas sales and a more favorable tax rate.

IBM, which needed a strong quarter to sustain the apparent recovery that began last summer, is not expected to disappoint.

Roaring along

DEC continued its double-digit growth rate with second-quarter revenue and profits climbing 22% over the second quarter of fiscal year 1987



INFORMATION PROVIDED BY DIGITAL EQUIPMENT CORP.
CW CHART

"It will probably not be a bad quarter. IBM is not cautioning anyone to lower their expectations," said Rick J. Martin of Sanford C. Bernstein & Co. IBM has done this in the past, such as in October 1986, when results were not expected to be good, Martin pointed out.

Recently reported results from key vendors of software, data communications equipment and semiconductors also reflect continued vitality in the wake of the crash. DCA said sales grew 19% to $54.8 million and profits rose 11% to $18.5 million in the quarter ended Dec. 31.

Intel showed further evidence of a chip industry recovery, reporting a 61% sales increase to $572.5 million in the quarter ended Dec. 26. Intel's operating income was $72 million, compared with a loss of $16.4 million one year earlier.

For the year, the chip maker earned $175.5 million from operations, a dramatic turnaround from its $183.3 million operating loss in 1986. Revenue for 1987 increased 51% to $1.91 billion.

Two of the software industry's fastest growing players, Oracle Corp. and On-Line Software International, Inc., both continued with strong momentum in the quarter ended Nov. 30. Oracle's revenue vaulted 113% to $60.3 million; earnings soared 151% to $7.6 million. On-Line, citing strong gains in overseas sales and maintenance fees, said revenue grew 65% to $21 million and earnings rose 69% to $1.7 million.

The independent computer leasing industry has also shown early signs of fourth-quarter strength. Richard Forsythe, president of privately held lessor Forsythe McArthur Associates in Skokie, Ill., reported that his and other small leasing firms had outstanding fourth quarters.

Senior writer Stanley Gibson contributed to this story.

Long-distance LANs

Bridges tap T1 power to link dispersed networks

BY ELISABETH HORWITT
CW STAFF

Local-area network bridge vendors have launched the new year with introductions that address their customers' need to link geographically dispersed LANs — without overwhelming their telecommunications budgets.

"The LAN-to-LAN T1 bridge is hot," said Joaquin Gonzalez, vice-president of the Gartner Group, Inc.'s Enterprise Networking Strategies Group.

Gonzalez was referring in particular to a new generation of intelligent bridges that provide increasingly efficient ways for users to connect multiple LANs over 1.5M bit/sec. T1 links. This breakthrough in bridges could provide a healthy boost to the T1 market, he added.

Until recently, companies that wanted to interconnect multiple LANs over remote links had to choose between bridges and routers. While a router can send a message directly to the right destination, a bridge must broadcast the message to all networks — at least the first time around. Several vendors' bridges reportedly remember a node's network address after the initial sending.

But while bridges are protocol-transparent, most routers can handle only one type of networking protocol, such as Digital Equipment Corp.'s Decnet or Transmission Control Protocol/Internet Protocol (TCP/IP).

Taking the bridge

This limitation was one of the main reasons General Motors Corp./Hughes Electronics chose bridges to interconnect a multisite Ethernet system that currently supports some 64 protocols, according to Jack Covert, head of technical support services at Hughes.

Covert admitted that the bridges on Hughes' network sometimes need to broadcast messages, which can use up more bandwidth than if the system used routers. However, wasted bandwidth is not a major concern for the company, which guarantees acceptable user response time by linking all major sites with dedicated lines that support a rate of at least 64K bit/sec., according to Covert. So far, network use reaches only 12% to 14% at peak hours.

The new bridge-router hybrids target companies with smaller bandwidth budgets and fewer networking protocols than Hughes has. Halley Systems, Inc. in San Jose, Calif., is expected to announce one such product, Connectlan, in February. The device can act as both a protocol-transparent bridge and an intelligent router that will support TCP/IP now, and the ISO's Open Systems Interconnect and possibly other protocols later on, according to Halley. Connectlan also offers more efficient use of available long-distance bandwidth by allowing multiple LANs, as well as voice devices, to share one T1 link.

Multiple LANs within one building or area can communicate over Connectlan's broadband backbone. The product will also feature a graphics-based network management system, Halley said. Prices were unavailable.

Vitalink Communications Corp. last week announced two products that address the demands of companies like Hughes for "true Ethernet speeds" across LAN-to-LAN bridges, Covert said.

The two new members of Vitalink's Translan bridge line are said to support up to 3M bit/sec. throughput in both directions.

The products can select the most efficient route from among alternate network paths and can also dynamically switch transmissions to a different route in case a line is down or overloaded, according to Vitalink.

Vitalink's Translan 350 connects Ethernet networks supporting either Xerox Corp.'s Xerox Network Systems or TCP/IP. Transring 550 links token-ring networks over synchronous, high-speed lines ranging from 56K bit/sec. to T1 rates. Both products are said to support up to two T1 links.

Priced at $18,500, Translan 350 and Transring 550 are expected to become available in April.

Routing TCP/IP

Another bridge router device that supports multiple T1 lines was announced late last year by Wellfleet Communications, Inc. in Bedford, Mass. The Link Node and Concentrator Node communications servers provide routing functions for TCP/IP or Decnet devices and bridge transparency for other protocols, according to Mark Strangio, the company's director of product marketing.

"And if IBM gets its stuff together, we'll support LU6.2 and the Token-Ring down the road," Strangio said. The products also allow multiple LANs to share a high-speed line with voice devices, he added.

The Link Node can support up to eight T1 lines and eight Ethernet LANs, with prices starting at $10,800. The Concentrator Node supports 26 T1 lines and 26 Ethernets and is base-priced at $12,000.

T1 vendors sprucing up lines in '88

BY ELISABETH HORWITT
CW STAFF

With 15% of the Fortune 1,000 evaluating T1 network technology for installation by mid-year and with a 40% annual growth rate through 1989, according to Salomon Brothers, Inc., the market for T1 products is taking off again.

Several products have been introduced recently that offer users more efficient use of their existing T1 networks, and more are expected to appear at the Communication Networks Conference '88, or Comnet, which will take place next week in Washington, D.C. Some recent introductions include the following:

- Network Equipment Technologies Corp. (NET) in Redwood City, Calif., last week announced a network processor said to concentrate up to 256 data connections onto a single circuit within an NET IDNX T1 switch.

Developed by NET acquisition Comdesign, the SPX is said to provide a cost-effective way for small sites to connect a limited number of asynchronous terminals to an NET backbone T1 network. One SPX can link as few as eight data channels over private lines, or several SPXs can be clustered together to support as many as 1,500 channels and 40 concentrated links, according to NET.

The device supports asynchronous or synchronous channel speeds of up to 19.2K bit/sec. and link speeds of up to 64K bit/sec. Priced at $250 to $350 per channel, the SPX is scheduled to begin shipping in March.

NET also announced a new version of its Enhanced Operator Console software, intended to provide network management across its IDNX switch family, SPX network processor and Series 2000 multiplexers.

Two compression devices said to boost a high-speed line's capacity for carrying data are expected to debut at Comnet.

- Aydin Monitor Systems in Fort Washington, Pa., will introduce the 6441 Quad Transcoder, said to compress four standard Pulse Code Modulation T1 links into a single 1.5M bit/sec. T1 circuit. The device can reportedly handle both voice and data output from a digital private branch exchange or any other T1 device using the D4 format, the vendor said. Available immediately, the unit is priced at approximately $30,000.
- Symplex Communications Corp. in Ann Arbor, Mich., is expected to introduce an eight-channel, dual-trunk addition to its family of data compression devices for leased-line networks. The Datamizer II SDC-8E will allow each line to carry as much as four times its normal traffic load up to a maximum throughput of 15.36M bit/sec., the vendor said. The product will be priced at $9,950.

In addition, several vendors have chosen this month to fill in gaps in their existing T1 product lines:

- Infotron Systems Corp. in Cherry Hill, N.J., plans to announce at Comnet the NX3200, a mid-range member of its NX family of T1 networking products. The NX3200 was designed to support up to eight T1 links and up to 250 channels. It is upgradable to Infotron's NX4600 T1 switch, the company said.
- Datatel, Inc., also in Cherry Hill, is set to unveil at Comnet its DCP9900 T1 Nodal Processor. With a price beginning at $20,000, this modular switch is said to support up to 18 T1 links, each with a throughput of 56K, 64K or 2M bit/sec.
- Datatel is also expected to announce the DCP9060 Sub-Rate Time Division Multiplexer, which can handle between eight and 30 asynchronous or synchronous voice/data channels. It is priced at $2,250.
- Last week, Digital Communications Associates, Inc. announced the System 9000-S, a low-end T1 multiplexer that can handle up to eight T1 trunks. Priced at between $25,000 and $40,000, the 9000-S is set to be available in the third quarter.

CORRECTIONS

The photos of Allen H. Michels, chairman and CEO of Ardent Computer Corp., and John William Poduska Sr., chairman, president and CEO of Stellar Computer, Inc. [CW, Jan. 11] were transposed.

Gary P. James, technical director in the advanced technology group of Arthur Andersen & Co. in Chicago, said he believes a partial implementation of referential integrity will be in the next release of DB2 but not a full implementation, contrary to a report in the Software & Services section [CW, Dec. 28, 1987/Jan. 4, 1988].

In the chart for the Spotlight on Application Development Tools [CW, Nov. 9, 1987], Magic Software should read Magec Software; the telephone number should read (800) DD-MAGEC.

In the Spotlight on Leasing and Used Equipment [CW, Oct. 12, 1987], the headline for the leasing firms chart on page S7 should read, "Top 10 independent leasing firms." The ranking should be as follows: Comdisco, CIS (CMI), Meridian (Unilease), Computer Financial, Capital Associates, CSA, Computer Sales International, Dataserv, Decimus and Randolph Computer.

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Delayed Microvax 3000s ready to begin shipping

BY JAMES CONNOLLY
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. blamed misunderstandings and an unexpectedly long period of "quality qualification" of disk drives for delays in shipments of the Microvax 3500 minicomputer and Vaxstation 3500 workstation.

The two 3500 systems will be available beginning in April, although orders placed now might not be filled until this summer because of an order backlog, according to Duncan M. Anderson, DEC marketing manager for Microvax systems.

Anderson also said the high-end Microvax 3600 will begin quantity shipments this month, and the Vaxstation 3200 will ship in quantity next month. He said several hundred Microvax 3600s are expected to be delivered by the end of this month.

When the four Microvax 3000 systems were introduced in September, DEC said shipments would begin by the end of 1987 and that volume deliveries of the Microvax 3500 and 3600 were set for early 1988. Anderson said DEC meant to say only that the 3600 would begin shipping by year's end.

He blamed "a very obscure, small problem that was discovered — literally — on the shipping dock" for the failure of the 3600 to ship in December 1987.

Anderson said the Microvax 3500 and Vaxstation 3500 will not be available until April. "The exit from quality qualification into production ramp-up took longer than expected with the RA70. There is not today a quality problem with the 3500s," Anderson said of those systems, both of which use DEC's new 280M-byte RA70 disk drive.

He said delays had been related to reliability, which has been improved. The Microvax 3600 and Vaxstation 3200 use different disk drives.

One analyst speculated that the delay in shipping the Microvax 3500 could hurt DEC by firing up the competition between DEC and IBM at a time when IBM is developing a system, code-named Silverlake, as a follow-on to the IBM System/36 and 38.

"The august thing is that it gives momentum to IBM as they get ready to announce Silverlake," said analyst Bob Randolph of International Data Corp., a Framingham, Mass.-based market research firm.

"With this in mind, if I were with IBM, I'd probably move up my announcement of Silverlake by a month or two," Randolph said, noting the 3500s could be delivered at about the time Silverlake is expected to be announced.

However, analyst Sandra Gant of the Cupertino, Calif.-based market research firm Infocorp, said a delay of a few months for the 3500s is unlikely to hurt DEC. "It really doesn't matter all that much, because for the next few months, there isn't that much that can hurt them, they are on such a roll," she said.

In an unrelated development last week, DEC formally introduced enhancements to two other members of the Microvax line.

Microsoft

FROM PAGE 1

may help solidify standards in the emerging PC network market with a strong SQL engine.

Users, however, were more cautious. Many said they will wait to see which standards emerge before committing to a technology for networked data bases.

Microsoft and Ashton-Tate are trying to position the SQL Server as the de facto open platform standard for third-party developers. Ashton-Tate will be the first to market with a compliant application, shipping a new version of its industry-leading Dbase package with SQL embedded in the program language by the end of this year, claimed Roy Folk, Ashton-Tate's executive vice-president of software. Ashton-Tate guaranteed that existing Dbase applications will be able to run against the SQL Server, providing its huge installed base a migration path to the new software.

Developers unfurled a list of other vendors, including Borland International, Symantec, Blythe Software, Inc. and Information Builders, Inc., that have also pledged to conform to the server standard.

SQL Server features a series of stored procedures that reduce data base access times and reportedly help ensure data integrity in multiuser environments. MIS could also be attracted by the package's transaction-oriented DBMS kernel that allows users to tap the data base while a DP worker carries out backup and recovery and other administrative tasks.

"For users, it's very good in that, for the first time, we'll end up with a standard data base engine based on a technology that is second to none," said Robert Therrien, an analyst with Paine Webber, Inc. in New York. "Standardization would make the front-end [applications] the means of differentiation and the back end a commodity."

Dueling servers

The drive for a standard, however, could touch off a fire storm of competition between Microsoft/Ashton-Tate and Lotus Development Corp., which has announced its own plans for a server-based DBMS compatible with IBM's DB2 mainframe DBMS. A Lotus official said the so-called Lotus DBMS can be made compatible with any SQL engine. However, Lotus and its upcoming DBMS product were conspicuously absent last week from the list of third-party developers pledging server support.

"It's much too early to tell other players like Oracle and Lotus that this is the standard," said Bill Higgs, director of software research for Cupertino, Calif.-based Infocorp.

Some users were equally skeptical about viewing the SQL Server as a standard.

"The concept is on target for what we're doing, but we're not necessarily going to do it with the Microsoft product," said Dan Cwenar, assistant director of systems technology at the Carnegie-Mellon Institute of Technology.

"It looks like a good tool, but a standard has to come from the bottom up, reaching a critical mass gradually," said R. Bruce Johnson, manager of the personal computing resource center at Deloitte, Haskins & Sells in New York.

SQL Server is based on technology from Sybase, located in Berkeley, Calif.

Although it was unclear what Ashton-Tate and Microsoft actually contributed to the package, Microsoft Chairman Bill Gates said SQL Server will incorporate all the functions available on Sybase's current minicomputer server.

Under the agreement, Microsoft has control over SQL Server, licensing it to Ashton-Tate for sale through its retail channels. Microsoft will sell the package to its OEM hardware customers, while Sybase will offer it to its current mid-range users.

Most industry experts praised the Sybase technology and the uncharacteristic show of good faith among two of the three largest PC software vendors. "[This] will have a lot to do with how corporate America uses its data," said Richard Finkelstein, an analyst with Codd and Date Consulting Group.

For its part, Ashton-Tate will get bragging rights to being the first data base application to tie into the open platform SQL engine, in addition to royalties shared with Microsoft from retail sales.

SQL pledges

FROM PAGE 1

Make no mistake, micro-based SQL technology will have its day. Most MIS professionals in large corporations say that standardized SQL on a micro will make users more productive by moving them closer to the data, allow them to use microcomputers as programmer workstations and provide them with a systematic method of accessing data and controlling its integrity throughout the corporation.

"The SQL language supplies the mechanism to get to data without having to follow a path, something a typical end user doesn't know how to do," said Gary James, advanced technology director for Arthur Andersen & Co.'s Advanced Technology Integration Group.

Benefit plan

Major benefits of SQL, according to users questioned by Computerworld

- Lets users run personal computers as programmer workstations
- Moves data closer to people working with it
- Cuts down on corporate training
- Secures data and ensures its integrity on a PC
- Gives users a systematic way of accessing data, thereby doing away with ad hoc queries

CW CHART

SQL "also allows developers of fourth-generation products to deal more with other parts of a product like the interface," he added.

It also makes a certain amount of financial and functional sense for SQL data bases to be on micros, according to Richard Finkelstein, a vice-president with Codd and Date Consulting Group and Publisher of "SQL Review."

IBM mainframe processing costs run to $150,000 per million instructions per second (MIPS), compared with $25,000 on a personal computer, Finkelstein said.

"As large transaction systems come down, they are easier to implement and cheaper to maintain on a micro platform. Plus, when you network systems together, there is greater extendability. You don't have to upgrade to larger mainframes," Finkelstein added.

Integration No. 1

The first priority of MIS executives, particularly those overseeing multiple IBM hardware platforms, is for SQL to integrate micros as seamlessly as possible with their larger systems.

"The main thing we are interested in is the ability to store some data remotely, have a central core base of data and have tools that access both with full integrity," said Bob Osacky, a senior systems analyst with Commonwealth, Inc. in Chicago.

Only 35 or so employees out of 16,000 are using SQL at Commonwealth, Osacky said. He said it will be years before a significant number of users are using SQL.

"We want SQL, but we want it to be compatible with our stuff on the mainframe," said Howard Fosdick, a project leader of relational data bases at Amoco Corp. "We want to write a Cobol program on a PC with SQL that looks similar to a Cobol program you write with DB2."

Seamlessly transporting data from micros to mainframes via SQL would also reduce training costs and increase the value of corporate data, according to several MIS executives.

"If I can train an individual to make use of a system on a mainframe, mini and micro, I'll save a major investment. And by accessing information from micros, minis and mainframes, I've increased the value of the information," said Tim Berry, senior software engineer with Financial Information Trust in Des Moines, Iowa.

What standard?

One factor that impinges on the SQL plans of large corporations is standards. While the ANSI committee has defined one standard, some say it is somewhat watered down.

More important to corporate users, however, is what IBM will do with its SQL embedded in OS/2 Extended Edition, which reportedly will not be available until July.

"From the viewpoint of a typical large IBM-oriented shop, I don't think the ANSI standards are that important. The IBM standards are what is important," Amoco's Fosdick said.

Some analysts said they do not expect to see that kind of conflict between ANSI and IBM on SQL standards. Most said they expect both sides to smoothly bridge any important differences.

Lacking integrity

Another factor holding up some corporations' plans is the lack of referential integrity — the ability to change one record and ensure that changes are made to related ones — in a micro-based product. Only Sybase, Inc.'s SQL engine has a simulation of that capability.

Referential integrity "is important if it's going to be truly integrated for all our machines," Commonwealth's Osacky said.

It could be some time before a full implementation of referential integrity is put on a micro, because there is no such capability yet on many mainframe data bases, including IBM's DB2.

Senior writer Alan J. Ryan contributed to this report.

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PS/2 add-on vendors told to pay up-front fees

Computer Automation claims right to memory card royalties from third parties

BY JAMES A. MARTIN
CW STAFF

IRVINE, Calif. — Computer Automation, Inc. last week charged that add-on board vendors selling IBM Personal System/2 Micro Channel memory cards may be infringing on its patent for a memory address allocation scheme and thus required to pay royalties.

According to Computer Automation, any third-party enhancement card vendor with memory boards for PS/2 Models 50, 60 or 80 will be required to pay a one-time royalty fee of $25,000 or $300,000, depending on the volume of boards produced. Those companies will also have to pay fees ranging from $1 to $5 per unit.

Vendors of PS/2 Model 50-, 60- or 80-compatible machines will be subject to the royalty as well, according to Computer Automation. To date, no vendor has announced or released any PS/2 Micro Channel clones.

One official at a board vendor agreed that the patent appears to be valid but said that any royalties paid by the board vendors would probably not cause board prices to rise noticeably.

In March 1987, IBM agreed to pay a one-time royalty of $100,000, in addition to per-unit costs, for licensing Computer Automation's patent for use in IBM's PS/2 Micro Channel architecture. IBM officials would not comment on the agreement last week.

Computer Automation's Automatic Modular Memory Address Allocation System patent relates to how add-on memory devices provide output signals that enable a computer system to determine a board's memory capacity. The scheme also enables the system's processor to determine the total available memory space.

Not without infringing

"We don't believe that either class of potential licensees can produce PS/2 clones or Micro Channel-compatible memory boards without infringing on our patent," Chairman George Pratt said in a prepared statement.

Not everyone believes their products are infringing on Computer Automation's patent, however.

"To the best of our knowledge, none of our boards infringe on the design in question," said Jane Bator, a representative for Quadram Corp., a third-party enhancement card vendor.

Phoenix to open design centers around the globe

BY ALAN J. RYAN
CW STAFF

NORWOOD, Mass. — Phoenix Technologies Ltd. last week said it plans to open hardware design centers worldwide, with engineering IBM Personal System/2 compatibles likely being the thrust of the business.

According to Rich Levandov, vice-president of marketing at Phoenix, the company's engineers will staff the centers, working with OEM customers to design PS/2-compatible computers based on Intel Corp.'s 80286 and 80386 chips. The units will be designed within a 16-week time frame, Levandov said.

Also to be designed at the centers are IBM Personal Computer AT-compatible computers and workstations based on Motorola, Inc.'s 68000 microprocessor, also within the 16-week time frame.

"Services will include . . . analysis to consulting but will focus on actual hardware design for clients," Levandov said. Planned sites include Honolulu, which will open within 30 to 45 days, and Europe, Taiwan, Tokyo and South Korea, all of which will open within 90 days, he added. Sites have already opened in Cambridge, Mass., and Scotts Valley, Calif.

"We've predesigned 20 to 25 workstation configurations, and all of those designs are sitting in our computer-aided design system," Levandov said.

Although PS/2-compatible chip sets are still not commercially available from companies like Western Digital Corp. and Chips & Technologies, Inc., Levandov said, Phoenix will be able to design ahead of the availability of the chips, so that when the silicon is readied, it can be dropped into the prototypes and tested.

"We're expecting the first commercial availability of our hardware in the February/March time frame," he added.

Levandov said Phoenix is not worried that IBM will file a copyright infringement lawsuit against it for designing PS/2-compatible equipment.

Phoenix is well schooled on how to create an IBM work-alike BIOS without infringing on IBM's copyrights, Levandov said, adding that the company can design functional compatibility in a manner dissimilar to IBM's design.

Two new UDS modems, featuring call guard capability, can restrict entry into your data base. Access can be limited to authorized users on dial-up or dedicated lines, whether communications are synchronous or asynchronous. The new modems may be configured for password, password plus callback or automatic pass-through.

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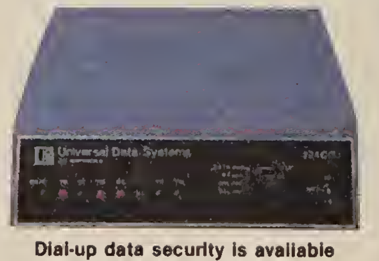

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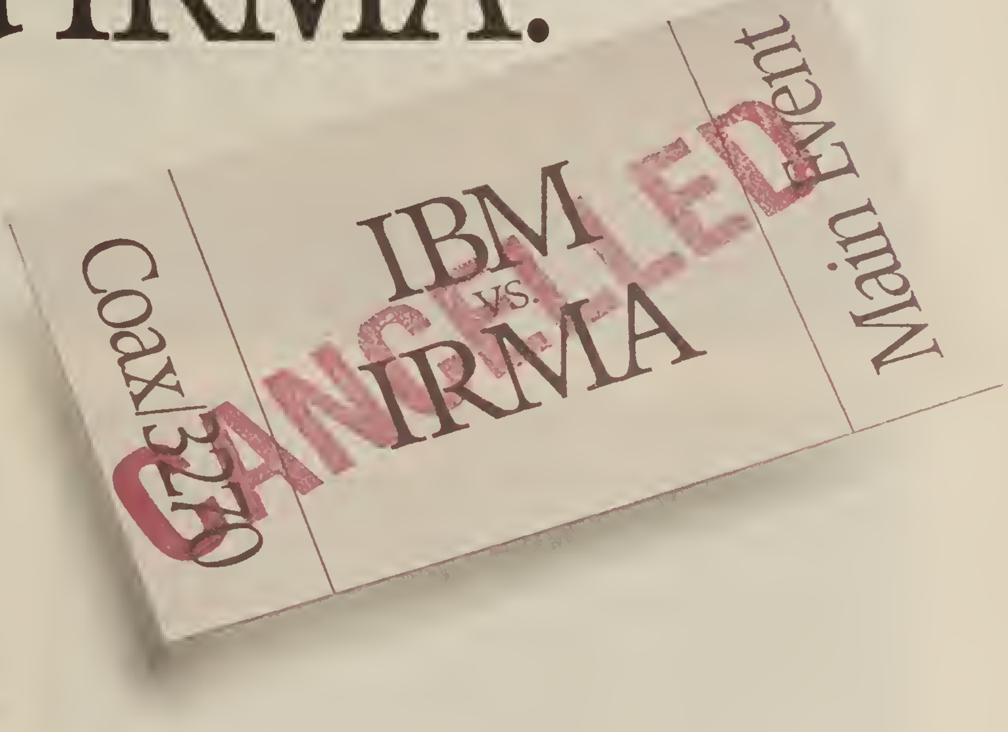

It no longer matters which 3270 emulation will become the reigning standard.

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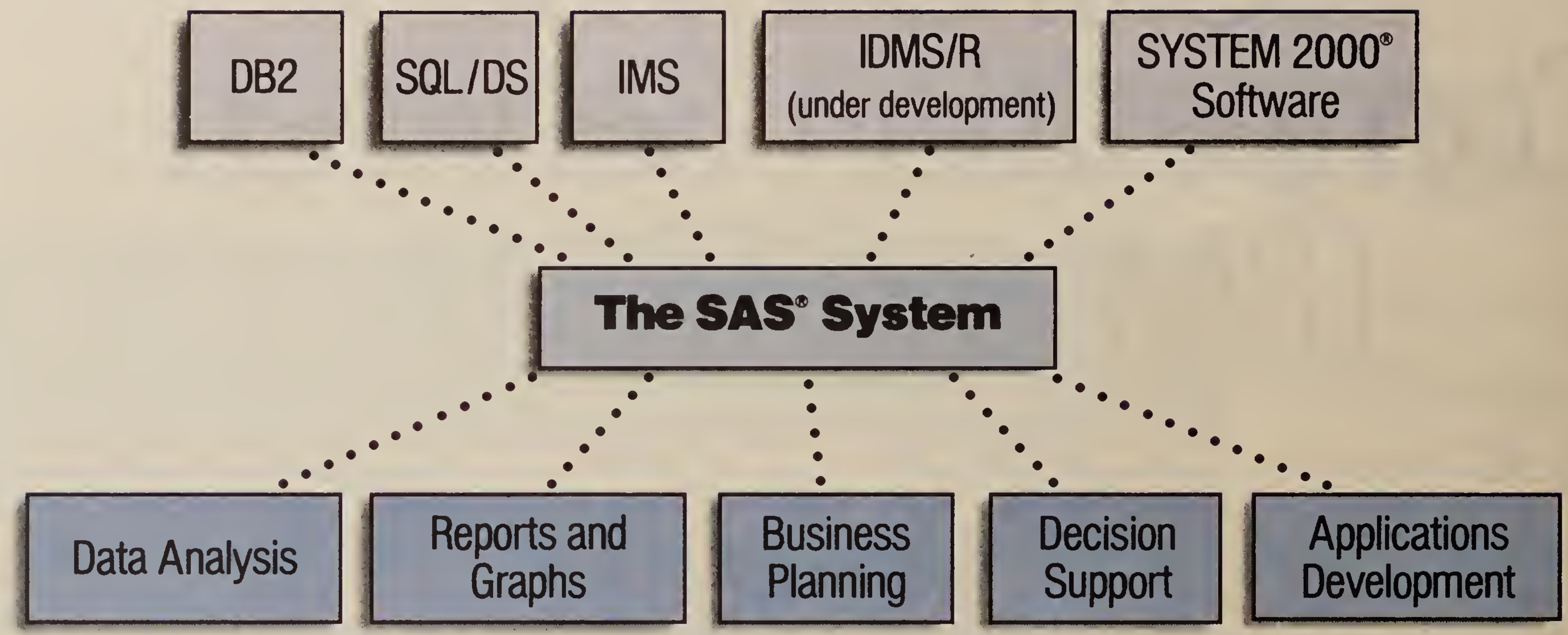

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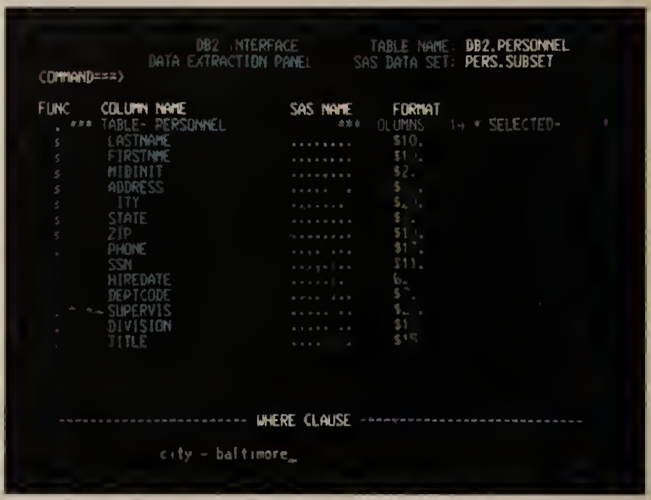

```
                    DB2 INTERFACE          TABLE NAME: DB2.PERSONNEL
                 DATA EXTRACTION PANEL     SAS DATA SET: PERS.SUBSET
COMMAND===>

FUNC     COLUMN NAME                SAS NAME      FORMAT
  .  *** TABLE- PERSONNEL                   ***  OLUMNS   14 * SELECTED-
  s        LASTNAME                 ........       $10.
  s        FIRSTNME                 ........       $1 .
  s        MIDINIT                  ........       $2.
  s        ADDRESS                  ........       $  .
  s         ITY                     ........       $  .
  s        STATE                    ........       $ .
  s        ZIP                      ........       $1 .
  .        PHONE                    ........       $1 .
           SSN                      ........       $11.
           HIREDATE                 ........       6.
           DEPTCODE                 ........       $ .
  .        SUPERVIS                 ........       $  .
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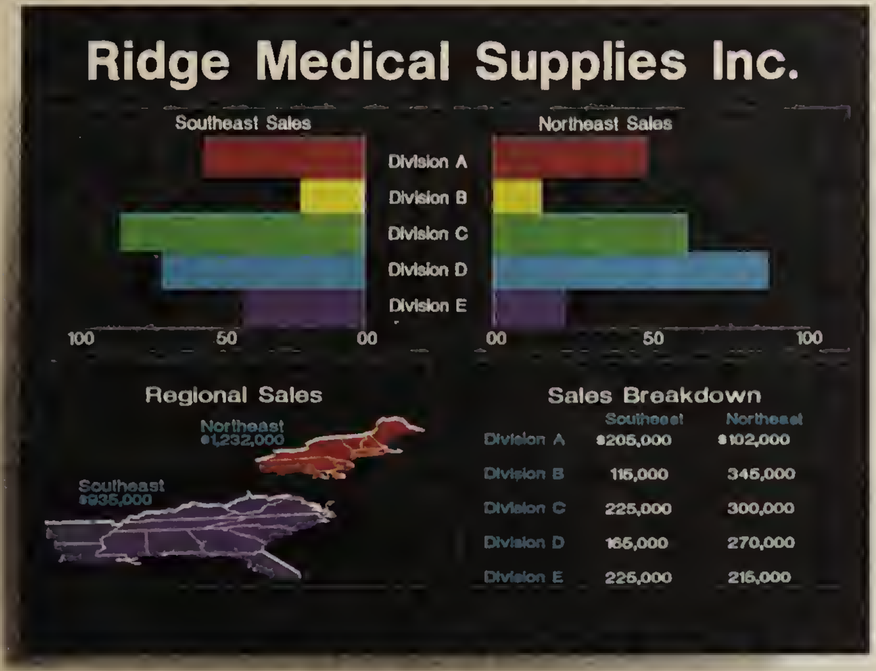

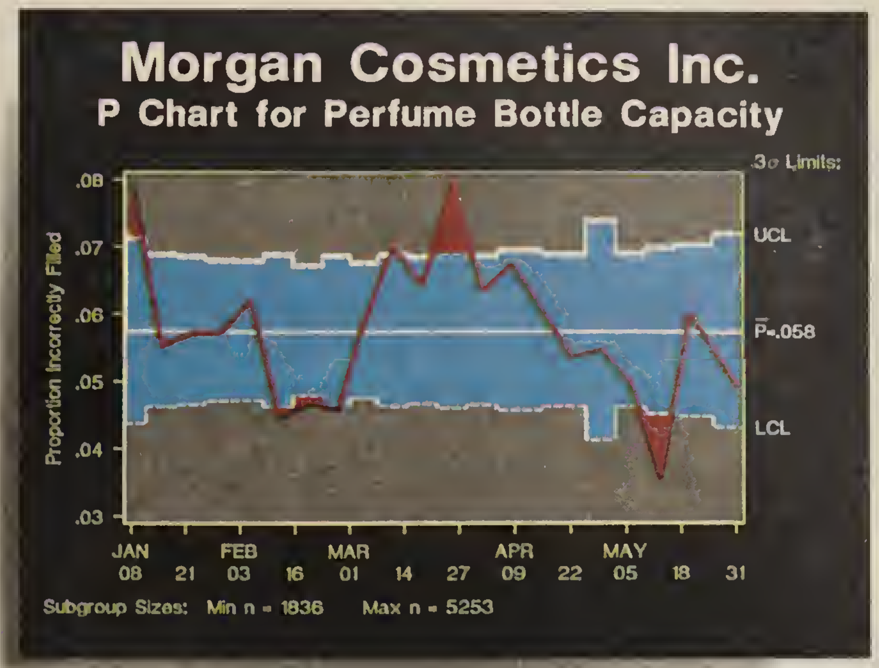

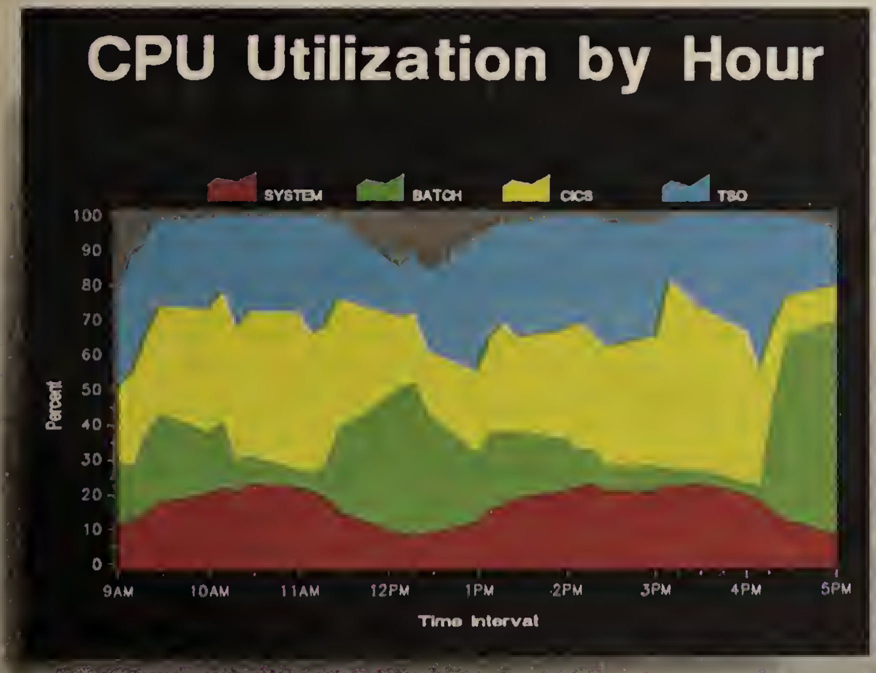

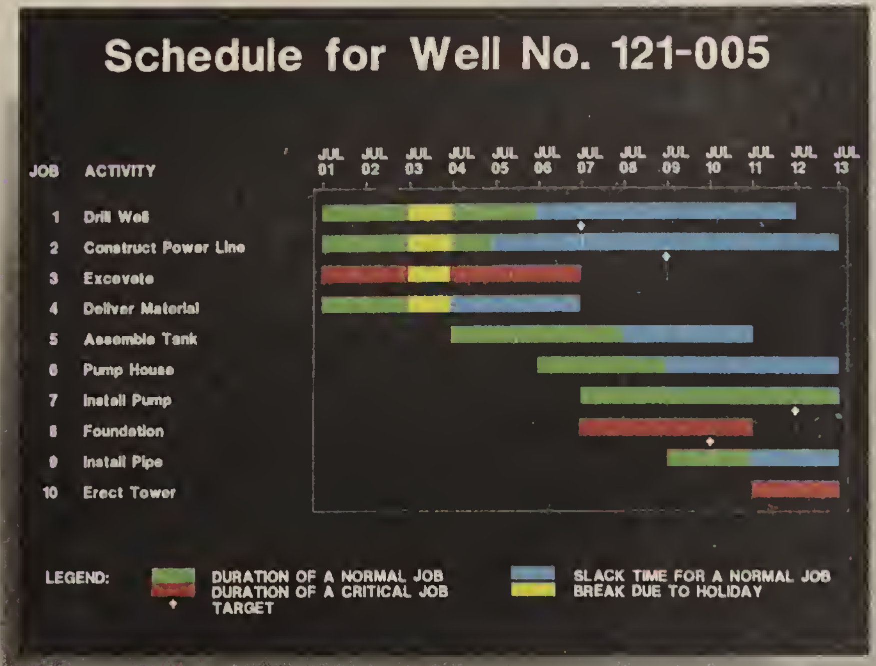

The SAS System runs on IBM Corp.'s 370/30xx/43xx and compatible machines, as well as minicomputers and personal computers.

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IBM pumps up mid-range channel

BY STANLEY GIBSON
CW STAFF

RYE BROOK, N.Y. — Laying the groundwork for its "System/3X follow-on" processor, also known as Silverlake, IBM last week announced changes in its relations with distributors geared to boosting sales of the yet-to-be-announced machine.

Under the plan, IBM created a new class of dealers, called authorized agents, most of whom will be drawn from its Marketing Assistance Program (MAP). While MAP dealers will continue to make sales calls accompanied by IBM salesmen, authorized agents will be permitted to make sales pitches on their own.

"There is really no way to cover those 4½ million prospects by yourself," said David Thomas, IBM group director of mid-range systems enterprise marketing, referring to an estimated total of potential mid-range customers.

Currently, a third party participates in three out of every four IBM mid-range sales, Thomas said. Most of the dealers who are expected to become authorized agents are experienced in the System/36 and System/38 product lines, according to Thomas.

"There is no question that this is paving the way for Silverlake," said David Andrews, president of ADM, Inc. in Cheshire, Conn., an IBM mid-range consulting firm. Silverlake, which IBM executives have said will be unveiled this year, is expected to combine features of both IBM's System/36 and System/38 and run software written for both.

Andrews and other industry observers say IBM's future in the mid-range hinges on the success of Silverlake, which will be geared to small users and new accounts. Andrews predicted that, over its product life span, Silverlake will outsell the IBM 9370 by a ratio of 8-to-1.

In other moves, IBM simplified its contracts for dealers and eased product ordering requirements. IBM also said it will make joint sales calls with value-added resellers (VAR) and remarketers.

In addition, the firm instituted a program to assist remarketers of competing equipment in converting their application software for use with IBM systems.

Counterattack

The measures are attempts to counter Digital Equipment Corp.'s successful use of third-party sales channels, according to Bob Randolph, a DEC analyst at International Data Corp. in Framingham, Mass.

IBM has "got to do something to counter the Microvax in new customer accounts," Randolph said.

"The thrust [of the authorized agent program] is toward new-account marketing," said Michael J. McGraw, president of Data Systems International in Kansas City, Mo., an early participant in the program.

In getting VARs to transport their software to IBM hardware, Dom DiMauro, program manager for IBM's mid-range application expansion program, said IBM will make its own systems engineers available to firms desiring to convert applications to IBM.

"The purpose is to recruit competitive VARs to write applications for IBM hardware," DiMauro said.

Because of the unique operating system of the System/38, which includes a built-in relational data base, code written for other processors could not take advantage of the System/38's unique qualities without considerable customizing, according to Andrews.

"You could take nonrelational code and run it on Silverlake, but it wouldn't be worth much. If you did that, nobody would buy it. You will have to redesign the code," Andrews said. He added that Silverlake will have many of the System/38's operating system features, including the relational data base.

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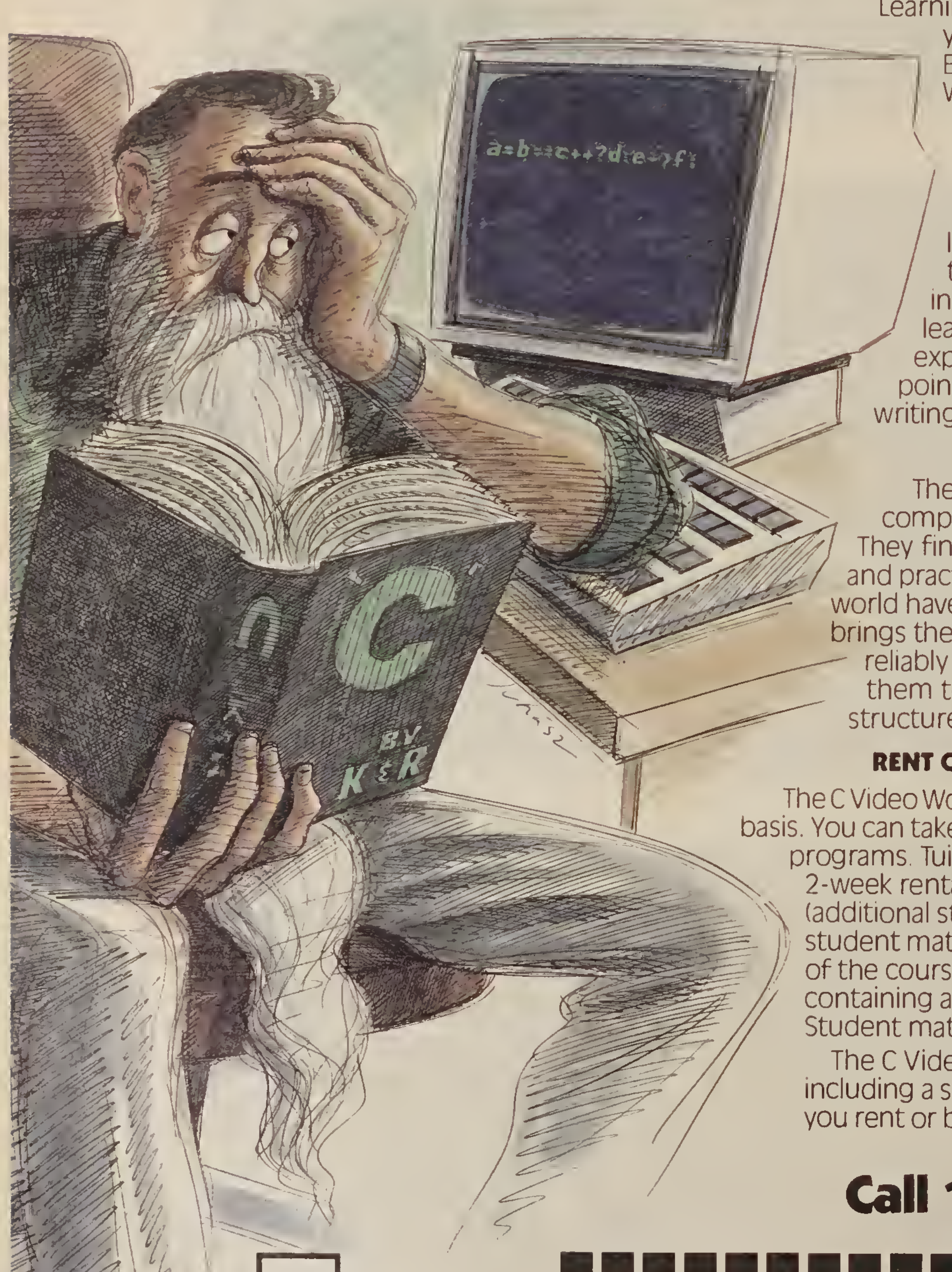

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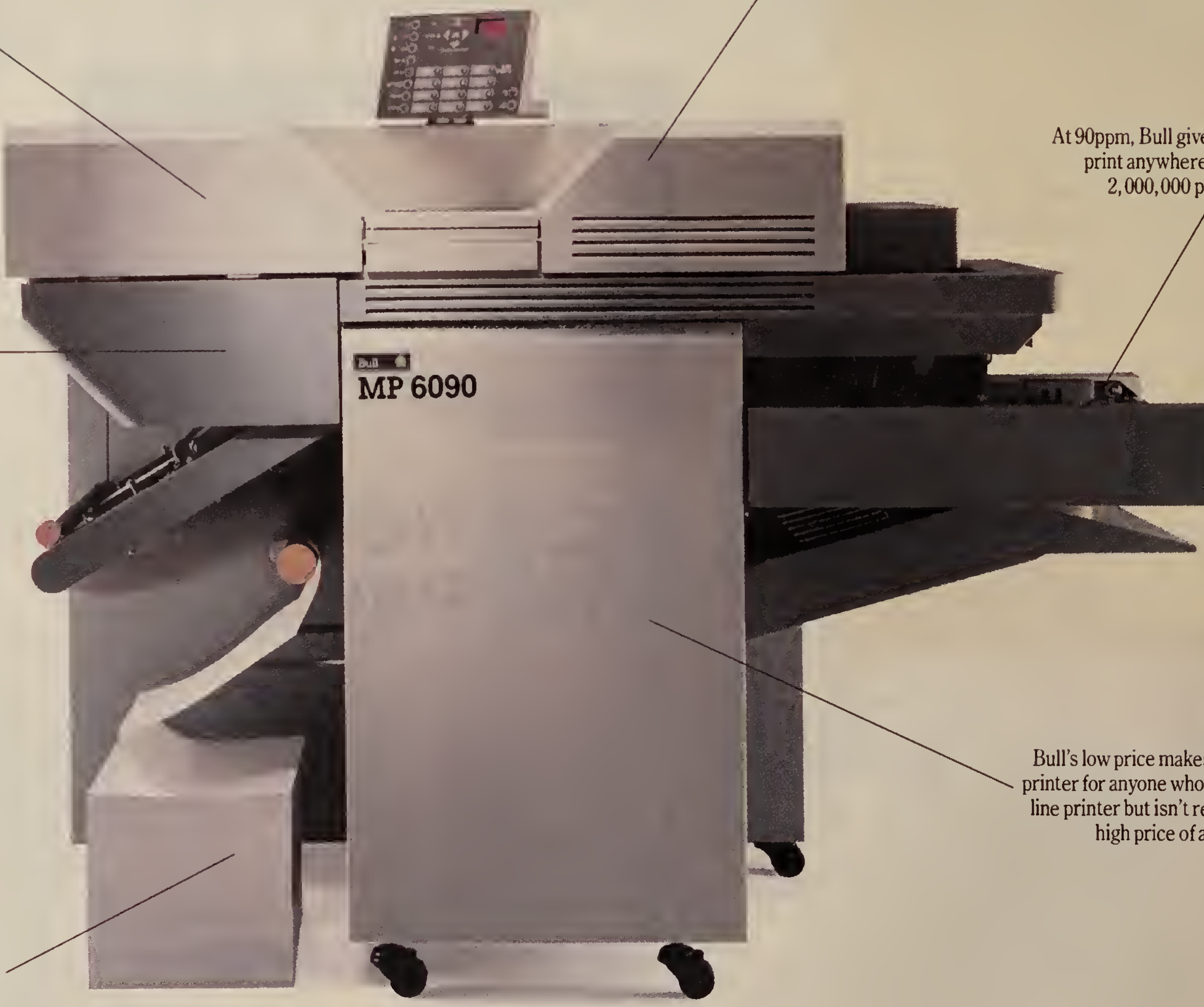

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McDonald's puts ISDN on menu

Fast-food giant finds technology tasty after year-long test

BY JEAN S. BOZMAN
CW STAFF

OAK BROOK, Ill. — First to take a bite out of Integrated Services Digital Network (ISDN) technology one year ago, McDonald's Corp. has decided to make ISDN a regular item on the fast-food giant's menu of telecommunications services.

McDonald's has decided to make ISDN a corporate standard, a move the firm formally announced at a joint conference with ISDN providers Illinois Bell, a Bell operating company, and AT&T Network Services last week.

The decision was made following a year-long test of ISDN devices at corporate headquarters here. Although there have been three ISDN trials nationwide, McDonald's is the first to complete the testing phase and move to paid service, starting at the middle of this year. "We've had three years of exposure to ISDN and one year of hands-on experience," reported Patrick Krause, staff director of telecommunications at McDonald's. "That gives us a tremendous amount of experience in a new technology."

Eying expansion

Unlike private corporate networks that bypass the AT&T national network, ISDN is provided at a regional Bell holding company's central switching offices, not on customer premises. McDonald's plans to expand from 100 to 400 ISDN lines at corporate headquarters this year and to move some workers into an all-ISDN building in August. The integrated voice/data service is provided by a modified AT&T 5 ESS switch in an Oak Brook switching center nearby.

Ameritech, the parent company of Illinois Bell, will begin to sell ISDN service throughout its five-state region after the McDonald's beta test of ISDN is completed in June. The commercial ISDN service, called Ameritech Integrated Digital Network, will be provided first in the Oak Brook area and will then be expanded to other Midwestern cities and states.

Pricing for ISDN service has not yet been finalized, according to Allen Cizner, vice-president of marketing at Illinois Bell, but it will feature a basic service with optional value-added features at additional cost. "The tariff will be filed competitively," Cizner said, "providing benchmark pricing information to all customers, not specific customers — and the packaging of ISDN-based services will be flexible."

> LIKE ANY first user of a product, McDonald's took a risk in testing the unproven ISDN technology in a workplace trial.

Like any first user of a product, McDonald's took a risk in testing the unproven ISDN technology in a workplace trial. However, the risk was limited to 100 voice/data lines, and the special ISDN equipment was provided by vendors such as NEC America, Inc., Fujitsu America, Inc. and Hayes Microcomputer Products, Inc. without charge.

ISDN end users get their choice of 300 voice/data features, including interactive host access from a variety of terminals, automatic display of a caller's phone number, voice mail and an electronic phone directory. Through ISDN links, users in different offices will be able to view electronic reports appearing on callers' screens. Then both parties can edit, review or comment on the text interactively — all while speaking on the phone.

Nixing redundancies

McDonald's MIS managers said they view ISDN as a practical step that will eliminate redundant wiring and the need to establish a private bypass network. "We don't have enough traffic between any two offices to justify the purchase of a dedicated T1 network," Krause said. "ISDN allows us to establish a virtual private network which acts as a transfer point between users and our mainframe hosts." That is important because of the geographical spread of end users at 9,700 McDonald's stores worldwide, 7,000 of which are in the U.S.

ISDN will support a variety of ways to send a file into the main computers. "There are SDLC links, messages from IBM 8100s in the field as well as files that are sent in from regional Unix-based systems," said Carl F. Dill Jr., vice-president of information services at McDonald's, referring to IBM's Synchronous Data Link Control. Sales and inventory information must be uploaded from many terminal types to the corporate Amdahl Corp. 5890 and IBM 3090 mainframes in Oak Brook. International stores send messages via CCITT X.25 packet-switched networks to a set of Tandem Computers, Inc. front-end processors attached to the IBM and Amdahl machines.

The intent of going to ISDN is to eliminate costly redundancy in coaxial cable connections and phone wiring. "We are ridding ourselves of the network spaghetti, as we like to call it," said Bonnie Kos, McDonald's vice-president of facilities and systems.

"ISDN means a lot to our corporation of penny profits and a penchant for details. We make money by scraping every bit of ketchup out of the can, and we believe that ISDN will help us to keep down the cost of our administrative overhead," Kos concluded.

Blimey! British Microsoft branch apologizes for sham Word report

BY RALPH BANCROFT
IDG NEWS SERVICE

READING, England — Microsoft Ltd., British affiliate of Microsoft Corp., last week publicly apologized for a fictitious evaluation report of its word processing package, Word 4.0. The promotional brochure was included in British computer publications and was purported to be an inhouse report produced by a company called West Engineering.

Microsoft admitted that the firm does not exist. The evaluation was compiled by Microsoft itself to promote what it saw as the benefits of Word 4.0 when compared with other word processing packages. "Rather than use a simple comparison chart, we wanted to get across to managers the key features of Word in plain English. We used the report format because this is the kind of thing they are used to reading," explained Mark Plant, Microsoft's marketing manager.

According to Plant, it was not until the brochure was printed that the company realized it might be mistaken for a genuine independent evaluation.

"Most people we have spoken to realize that it was a spoof. However, if anyone was misled in thinking it was a report from a real company, then we apologize unreservedly," Plant said.

> "MOST PEOPLE we have spoken to realize that [the phony report] was a spoof. However, if anyone was misled. . . then we apologize unreservedly."
>
> MARK PLANT
> MICROSOFT LTD.

The brochure drew immediate complaints from rival software vendors that the phony report was inaccurate in its conclusions.

Of IBM's Displaywrite 4, the report said, "It fails to meet many of our basic word processing needs, let alone our more specialist users'. As a page-orientated program, it is totally unsuitable for long documents."

Lotus Development Corp.'s Manuscript is criticized in the report because "its specialized approach makes it difficult to learn and use and unsuitable for a lot of basic word processing tasks."

Multimate International Corp.'s Multimate Advantage II, according to the report, "promises fast text processing. But it is fundamentally page-orientated, so formatting and scrolling through long documents is awkward and slow."

Wordperfect Corp.'s Wordperfect 4.2 — currently the UK's top-selling word processing package — is described as lacking "many of the essential facilities which we need. It does not support style sheets, glossaries or outline processing, and it cannot link directly to Lotus 1-2-3 or Microsoft Excel."

Micropro International Corp.'s Wordstar Professional 4, the report says, "has little to recommend it. Its user interface is unfriendly, and the program is difficult to use, without any context-sensitive Help."

Word 4.0 is the only program to escape critical comment. The report concludes: "It offers a wide range of power features, including conditional mail-merge, programmable macros and outlining. Its style-sheet facility makes elaborately formatted, long documents easy to create."

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EDITORIAL

Tough choice

LAST WEEK'S STRATEGIC alliances between some of the industry's largest players may ultimately create as many problems as they solve.

In separate agreements that will affect virtually every MIS organization, Microsoft, Ashton-Tate and Sybase linked up to develop a networked data base management system, while DEC and Apple joined forces to bind their systems more closely together.

These deals will be promoted as bringing stability to key markets. But it would be shortsighted to ignore the overtones of competition in both agreements. Amid all the backslapping and handshaking, the vendors have created a new set of competing standards and another series of difficult choices for MIS.

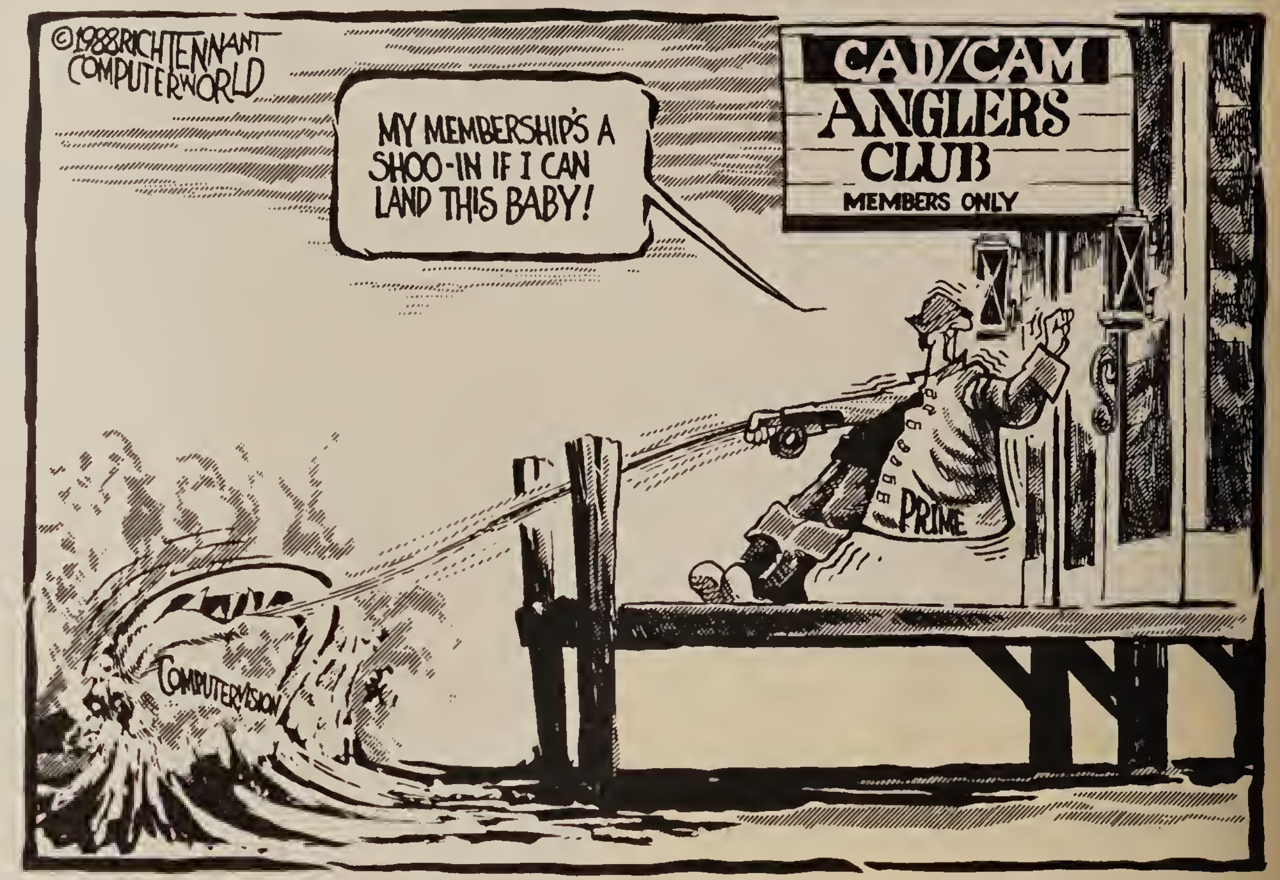
Microsoft, Ashton-Tate and Sybase's announcement of an open architecture, server-based DBMS for the OS/2 operating system is as much a shot at Lotus as it is a magnet for third-party development activity. Lotus has already announced its server-based product — code-named Lotus DBMS — and plans to deliver it at about the same time as the Microsoft-led triumvirate. Furthermore, IBM has yet to sketch its DBMS plans for network servers. Its OS/2 Extended Edition, also set to debut in the fall, contains data base elements that may or may not play with the competing products.

What a choice for MIS buyers! Are you better off commiting to one of the two independent standards or waiting to see what IBM has up its sleeve? While all three technically use SQL, Ashton-Tate Chairman Ed Esber acknowledged last week that "everyone's SQL is slightly different." And since none of the products will be available for at least six months, there is no way to compare their features in advance.

Also daunting is the wrinkle the DEC-Apple alliance has put in the industry. Apple scored a coup in gaining the endorsement of the most significant non-IBM computer maker. But for DEC, the agreement is driven as much by its two spectacular failures in the personal computer market as its desire to create a strategic partnership. The hidden message is that DEC has all but given up on its efforts to integrate the PC.

What does that mean for its customers with large numbers of PCs, Rainbows or Vaxmates? Will MIS managers increasingly find themselves facing an either-or decision between the IBM standard and the DEC-Apple alternative? The end result may be greater divergence from industry norms rather than broader acceptance.

When decisions like these are necessary, MIS organizations need to step back and evaluate their philosophies toward corporate standards. High rollers with aggressive users might seize the opportunity to adopt new technologies, even if it means being on the bleeding edge. Those who like to play it safe are better off waiting to see which standards truly emerge. And vendors need to respond to their customers' questions about just who is compatible with whom.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LETTERS TO THE EDITOR

Takes exception

I am writing in response to Alan Radding's article, "Race of power vs. position" [CW, Dec. 21, 1987].

With regard to his comments on Paperback Software's VP-Planner, this product was launched in late 1985 by a company with almost no cash. We took on Lotus Development Corp., the leader in the spreadsheet industry.

According to most independent data, including *Computerworld*'s, we have taken 6% of the market in two years. According to a CW table, we are now the No. 2 spreadsheet for the IBM Personal Computer. Microsoft Corp., with Multiplan and Excel, led us in total shipments, but the bulk of those shipments apply to non-IBM microcomputers, such as Apple Computer, Inc.'s Apple II and Macintosh.

If Paperback Software had had the luxury of a multimillion dollar advertising budget, maybe we would have made a bigger splash with our entry.

As for our mispositioning the product as a Lotus clone, not once in any of our advertising campaigns or press releases did we so position the product. Every advertisement we ran strongly stressed our data base capabilities. It was the press that insisted on referring to our product as a Lotus clone despite our repeated attempts to convince journalists who so referred to VP-Planner and to explain to them what the product really was.

In the future, we will be watching to see how CW reports on one of our competitors that, in the last weeks of 1987, introduced a moderately low-priced spreadsheet in one of the greatest blazes of media advertising the industry has seen. That company is reported to have shipped 50,000 units in the last two weeks of December.

Having looked at one of these units with some care, we realized the product was shipped six months early, and what our competitor did was put 50,000 time bombs into the market to blow up under its own feet.

I wonder if CW will have the guts to report accurately on this situation or whether it will simply roll along with prevailing ignorance and tout the company as something other than an also-ran.

The truth is that for many users, the additional power provided by VP-Planner and VP-Planner Plus is irrelevant since the basic spreadsheet capabilities are already far more than they need.

When we introduced VP-Planner in 1985, we could have chosen one of two strategies: price the product high, selling it to the few users who really needed our advanced data base capabilities, or price the product low and go after the market of users who could not afford Lotus's high prices. We made the decision to take the latter path because our calculations showed that it would generate more revenue.

Adam Osborne
Chief Executive Officer
Paperback Software
Berkeley, Calif.

This week in history

Jan. 16, 1978
Technological developments and IBM's willingness to cut prices to become competitive grease a downward spiral for prices of medium- and large-scale computer systems. For example, a 4M-byte IBM 3032 costs less today than the March 1977 price of a 2M-byte 370/158-3 — $2.1 million vs. $2.2 million.

Jan. 17, 1983
The divested Bell operating companies reveal the first two services they will offer after divestiture from AT&T: a 56K bit/sec. circuit-switched service and a local-area data transport service that will support simultaneous voice/data transmission between a user site and a backbone packet-switching network.

Move to Russia

I read the article "From Russia with love" [CW, Nov. 23, 1987].

In my opinion, Saxpy Computer Corp., Tony Yates and Ivan-Pierre Batinic, along with his cronies, ought to take their technology and move to Russia. It is a sad day when traitors are praised because they are responsible for a few more bucks being made due to deals made with our country's enemies.

It is also sad that *Computerworld* does not have something better than this to write about.

Joseph F. Walker Jr.
Bartlesville, Okla.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.*

How to spot the true colors of a rare breed — the expert

JOHN BARNES

Though we may not wish to admit it, most of us are fully replaceable. Your company — any company — can usually hire someone for about the same price to do the same thing. As the employment agencies like to say, "There are a lot of people out there with your resume."

Sometimes, though, managers need a different breed — the rare expert, the one whose expertise is hard to find and costs accordingly. Every so often, the company needs somebody to "hemulate the fratistat," and, as everybody knows, there are only a dozen or so fratistat hemulators in the world. Unless your company is very big or very lucky, you will have to call in an outside expert.

For the typical manager or project leader, finding the needed expert is just the beginning of the trouble. Aside from guiding him through all the new-kid-on-the-block adjustment problems, you are also trying to supervise something — and someone — you may not quite understand yourself. How do you fly blind without hitting a wall?

Here are a few rules of thumb:

- Something is wrong if the expert you hired is spending most of his time explaining what he does.

You want him to do his specialty, not offer a course in it. If he's spending all his time explaining, several things might be wrong.

Maybe you need to hire more people to make the new system work, and he is trying to turn your current employees into those people. Or maybe he is insecure in his skills and feels the need to show off — obviously not a good sign.

You may be trying to micromanage him, and his explanations are intended to get you off his back. Of course, his time spent explaining can lead to a lack of progress, which leads to panic and, thus, to more micromanagement and so forth in a downward spiral.

MANAGERS have a vested interest in the outside expert; they don't want their decision to look like a blunder. This predisposition to see a good job being done can cloud their perceptions of value.

Or your employees may be picking his brains, getting some unscheduled advanced training.

- Something is right if he goes through a formal process for deciding whether what he does is actually what you need.

BILL RUSSELL

If you don't quite understand exactly what your expert does, you might very easily be trying to buy a Big Mac from Colonel Sanders. A fly-by-night expert doesn't care — he'll take your money and run before you realize what you got. The one you want to hire only accepts clients he can really help.

- Something is wrong if, after a few weeks, the managers are impressed and the engineers aren't.

Once the decision to hire has been made, managers have a vested interest in the outside expert; they don't want their decision to look like a blunder. This predisposition to see a good job being done can cloud their perceptions of value.

Engineers, on the other hand, might dislike the newcomer at first; but if he gets the job done, they will come around fairly quickly.

- Something is right if he wants to talk to people you wouldn't have thought of involving.

Chances are that the expert's arcane knowledge applied to your situation will produce impacts you will not be aware of but that he anticipates. Taking responsibility for those subtle second-order effects indicates knowledge and experience plus a commitment to making your project succeed.

- Something is wrong if he spends most of his time talking to people who are far higher than the project on the organizational chart.

This situation might grow out of plain old micromanagement from the top or your vice-president's desire for a more interesting companion at lunch. Whatever the reason, it ought to set off warning bells.

The mark of the true nonproducing expert is to cover all of his political bases. That is how he keeps getting paid without actually doing anything useful.

By contrast, a real expert will have little time for or interest in office politics. His focus will be on the work itself. If he is any good, he won't be around long enough for office politics to matter to him.

- Something is right if he starts making plans for turnover to your personnel early.

Ideally, the turnover ought to be planned before the work starts. Good turnover of the project to the staff is the difference between limping along afterward and moving smoothly back into normal operation.

Moreover, if your expert is planning the turnover, it is a good indication that he intends to finish the job and move on — and that's what you're paying him for, isn't it?

Barnes is the Pacific Northwest area manager for ADG, a high-tech marketing organization based in San Pedro, Calif. His first novel, *The Man Who Pulled Down the Sky*, was published by Congdon & Weed. His second novel, *Sin of Origin*, will be published this spring.

Beware of alchemists bearing super gifts

JOHN KIRKLEY

So this guy walks into your office wearing a pointed black hat and a flowing black robe with signs of the zodiac painted all over it, and he says, "Hi, I'm the alchemist."

Then he does something quick with his hands, and the next thing you know, he has this little dish with a stone in it and curls of smoke all around it, and right above it, floating in mid-air, just hanging there, is a little magnet.

"What you see," he says, never taking his eyes off you, "is superconductivity, and it's going to solve all your computer problems.

"I have right here a glossy brochure that describes our new 400-MIPS system, which, as you can see, comes completely housed in an attache case made of handsome, genuine, handsewn leather. Get rid of those clunky IBM 3030 systems in your basement. Be the first on the block to own the Super Spectacular Tesla 2000, the computer of the future," he adds.

In today's world of high-temperature superconductor research, there is fertile ground for a little inspired hucksterism.

High-temperature superconductors have the potential to revolutionize the computer industry. With very big bucks at stake, it is no wonder that researchers, scientists and even a few fringe folk are rushing to stake their claims.

Superconductor materials that operate at room temperature could, with minimum power requirements and almost no heat dissipation, provide ultrafast switching devices that operate 50 times faster than today's circuits.

Reputable organizations around the world, including IBM, Hewlett-Packard, AT&T, Westinghouse and European and Japanese firms, are mounting major efforts in the field.

Still locked in the labs

Today, high-temperature superconductor materials are still in the hands of the lab scientists. There is no timetable for the materials to be transmogrified into forms that can be used for practical applications; it could be tomorrow, it could be 10 years from now. No one really knows.

At this juncture, the ultimate consumer — you, the information systems professional — need only observe all the furor with detached interest and wait

Continued on page 23

Kirkley is an industry consultant currently acting as editorial adviser to Patricia Seybold's Office Systems Group. He is based in South Nyack, N.Y.

Explaining the executive MISnomer

MICHAEL SULLIVAN-TRAINOR

As executive vice-president of management information systems, the veteran professional possessed the longest title in the corporation. That distinction did not please him, however, because people still thought of him as the top techie.

"People look at the words MIS Administration on my door and think, 'MISadministration' or 'MISmanagement.' We need a change," he told his chief executive officer.

This wasn't the first time the MIS executive had discussed his concerns with the CEO. They both agreed that something needed to be done.

"I'm glad you brought this up," the CEO said. "I met with the board last night, and I'd like to congratulate you on your promotion to the position of senior vice-president for corporate information."

Finally, the MIS executive had a title that gave him the appropriate status, reflecting the way his role was changing.

Mainframes to meetings

When he started working in data processing 15 years ago, he considered himself a techie. After all, his job was managing the central computer system and its support staff.

But today, he was so far removed from the details of running the systems that he relied on his chief lieutenants to choose the technical managers and on the managers to choose their own programmer, analyst and operations staffs.

His days were spent in meetings. He met with the CEO to set long-range information systems objectives that would help the

Continued on page 23

Sullivan-Trainor is a senior writer at *Computerworld*.

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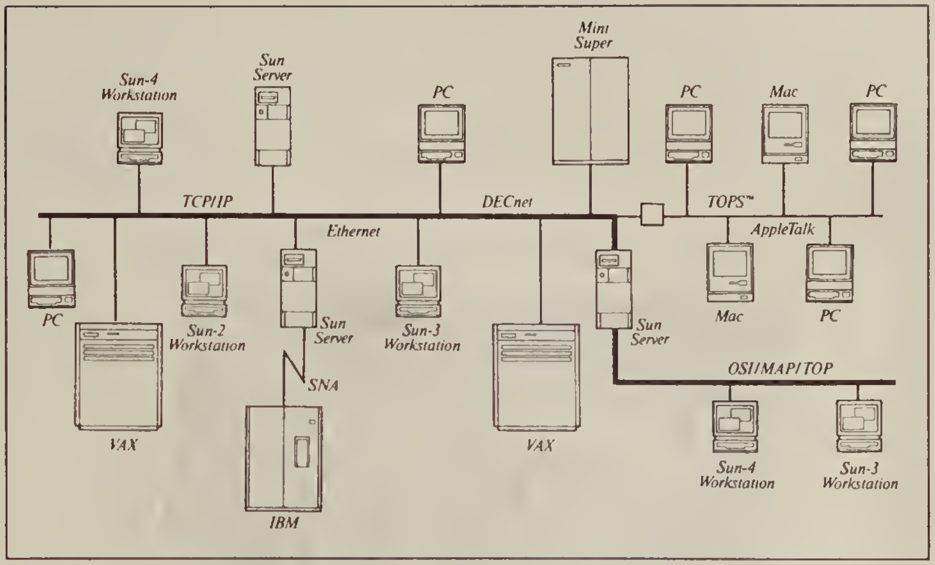

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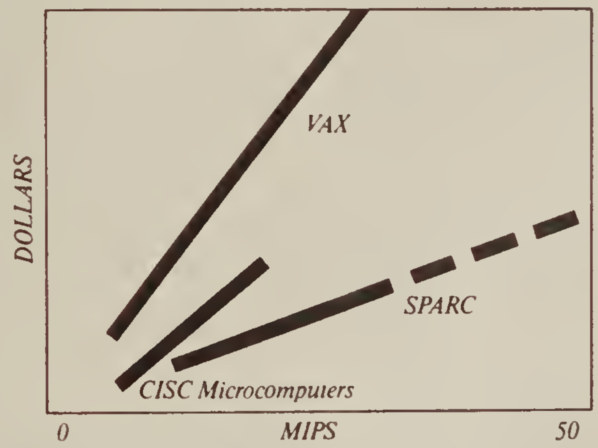

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Alchemists

CONTINUED FROM PAGE 19

for the day when the engineers can take over and make something that you can use.

However, keeping abreast of the latest developments in superconductivity has several benefits.

First of all, it is highly entertaining. Very rarely has there been such a scramble for fame, fortune and Nobel prizes.

Second, you will be up to snuff if the chairman of the board or your chief executive officer asks why you are not installing the Tesla 2000 that he read about in the National Enquirer while he was waiting to check out at the supermarket.

Finally, you will have a good idea who the real superconductor players are, and you will know when the technology is beginning to emerge in usable form.

Beginnings of the boom

The current superconductor boom began in April 1986, when IBM researchers K. Alex Muller and J. Georg Bednorz reported the results of their investigations into the superconducting characteristics of ceramics. They unveiled a material that remained superconductive at almost 40 degrees Kelvin (-388 degrees Fahrenheit). It was the first major breakthrough in a half-century, and the two received a Nobel prize last October.

But it was Paul W. C. Chu's teams at the University of Houston and the University of Alabama that sparked a scientific feeding frenzy when they announced that the combination of four elements — one part yttrium, two parts barium, three parts copper and various amounts of oxygen — achieved superconductivity at the record high temperature of 98 K (-283 F). At higher temperatures, inexpensive liquid nitrogen can be used to cool the ceramic to a superconducting state rather than hard-to-handle and expensive liquid helium.

Immediately, laboratories all over the world went into overdrive. Scientists began sleeping on cots in their labs and living on fast food brought in by dazed assistants. The race was on.

Not only the big, prestigious labs were in on the action. High school students, following Chu's recipe, were cooking up samples of the ceramic substance, immersing them in liquid nitrogen and happily levitating magnets — a phenomenon called the Meissner effect, caused by the characteristic of superconductors to repel magnetic fields.

Since then, claims of high-temperature superconductivity have been coming thick and fast. Among those who made media headlines were researchers at Sumitomo Electric Industries Ltd., Colorado State University, the University of California at Berkeley, the University of Maryland and North Carolina State University.

Other claimants are a 16-year-old high school student from Hawaii and Stanford Ovshinsky, CEO of Energy Conversion Devices, Inc., a Troy, Mich., firm known more for its colorful leader than for a long history of delivering products.

One firm that has produced a product using superconductor technology is Hypres, Inc. in Elmsford, N.Y. Using proven low-temperature superconducting materials, Hypres markets a high-speed (picosecond range) signal processing workstation using Josephson junction technology. Hypres is interested in applying superconductivity to computer technology, but CEO Charles Francisco is taking the long view. "It may be years before the materials research phase is completed," he says.

Hypres currently is investigating these materials, but, as Francisco cautions, don't hold your breath waiting for the practical breakthrough. Many problems of stability, malleability, handling highly magnetic fields and more have yet to be overcome.

So, until the day when credible companies begin to offer technology based on thoroughly engineered high-temperature superconductor materials, stick with silicon, watch the progress of gallium arsenide, be cognizant of what companies are doing with low-temperature superconductors, and, by all means, beware of alchemists bearing briefcases.

MISnomer

CONTINUED FROM PAGE 19

company achieve its business goals. User executives from other divisions always wanted his time to discuss how, together, they could advance divisional goals.

His senior staff members needed constant supervision to keep them in line with the corporate mission and away from the pursuit of technology for its own sake.

The letters spelling out his new title were barely dry on the door before a manufacturing division executive marched into his office demanding to know what this was all about. Was MIS now in charge of the logistics information that he maintained? If that were the case, then he might as well manage the production lines, too, the executive said before storming out.

The senior vice-president's senior managers came in next, saying they were busy enough without taking on the issue of who should be allowed to have what information.

He assured them that he would call a staff meeting soon. Then the new senior vice-president sat back in his chair and pondered how, now that he had a more accurate title, he would go about explaining what it meant.

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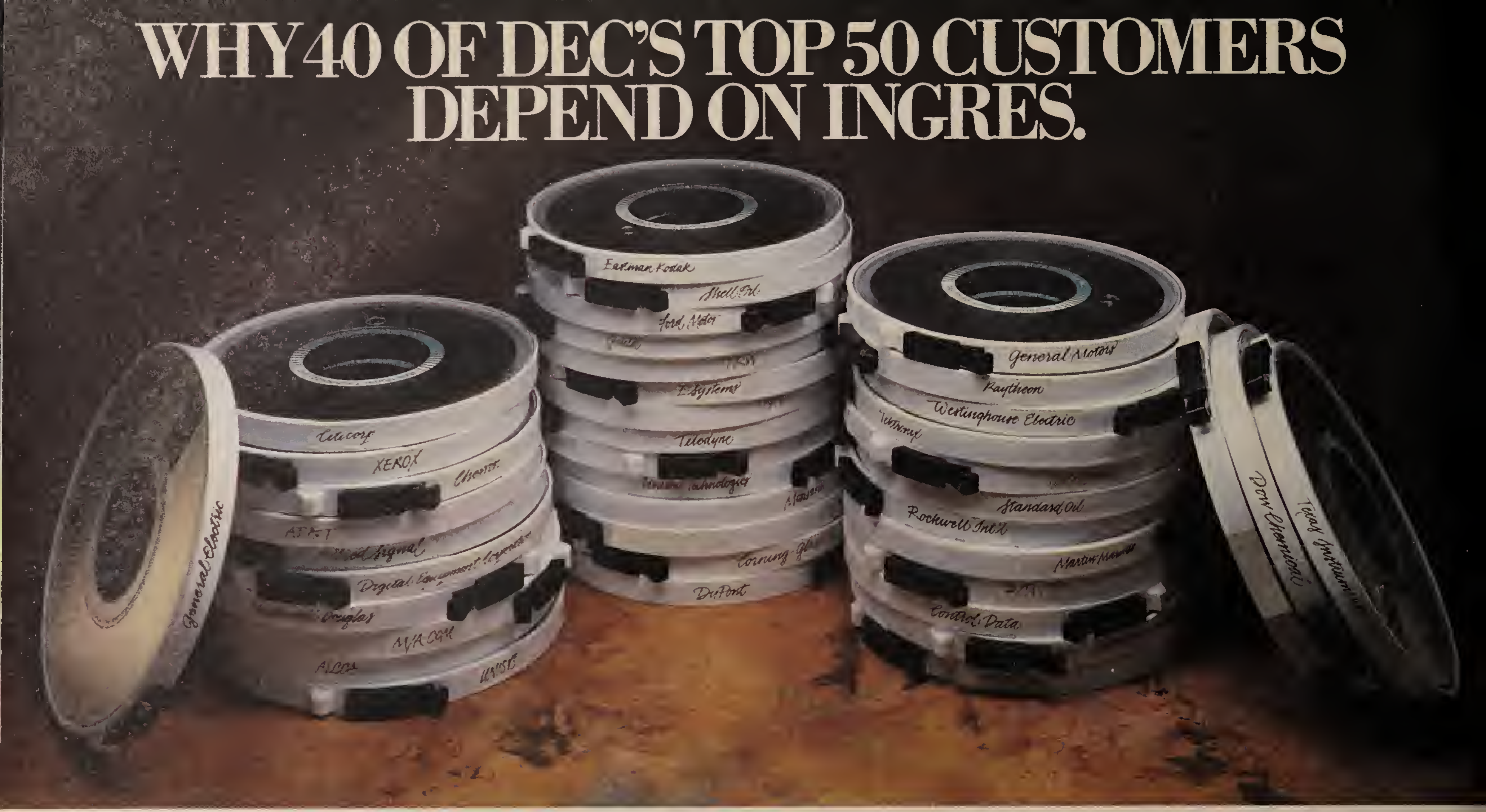

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   - 30. Medicine/Law/Education
   - 40. Wholesale/Retail/Trade
   - 50. Business Service (except DP)
   - 60. Government — State/Federal/Local
   - 65. Communications Systems/Public Utilities/Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
   - 90. Computer/Peripheral Dealer/Distributor/Retailer
   - 75. User: Other ____________
   - 95. Vendor: Other ____________ (Please specify)

2. **TITLE/FUNCTION**
   IS/MIS/DP MANAGEMENT
   - 19. Vice President, Asst. VP
   - 21. Dir., Mgr., Suprv. IS/MIS/DP Services
   - 22. Dir., Mgr., Suprv. of Operations, Planning, Adm. Services
   - 23. Dir., Mgr., Suprv. Analyst, of Systems
   - 31. Dir., Mgr., Suprv., of Programming
   - 32. Programmer, Methods Analyst
   - 35. Dir., Mgr., Suprv., OA/WP
   - 38. Data Comm. Network/Systems Mgt

   OTHER COMPANY MANAGEMENT
   - 11. President, Owner/Partner, General Mgr
   - 12. Vice President/Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt
   - 51. Sales/Mktg. Mgt

   OTHER PROFESSIONALS
   - 60. Consulting Mgt
   - 70. Medical, Legal, Accounting Mgt
   - 80. Educators, Journalists, Librarians, Students
   - 90. Others ____________ (Please specify)

3. **COMPUTER INVOLVEMENT** Types of equipment with which you are personally involved either as a user, vendor, or consultant
   - A. Mainframes/Superminis
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems
   - F. No Computer Involvement

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SOFT
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William Inmon

Archival data comes of age

One of the underlying trends of the data processing industry can be characterized as pushing the power of automation toward up-to-date, on-line systems for an increasing number of users. Lost in the rush to embrace new technology and new users, however, is archival data.

Archival data is simply the historical collection of data. The better known cousin of archival data is data that reflects the up-to-the-second value of information — current-value data — which is the focus of systems in banking, insurance and manufacturing. The importance of current-value data is unquestioned.

But as current-value data turns into historical data, the perceived importance of the information often diminishes. At best, archival data is an afterthought. Whatever data happens to be left over at the end of the day is what gets archived.

But the 1990s may turn into the decade of archival data, because there is a world of promise in it. Unlocking the potential of archival data presents opportunities that have, at best, been only vaguely explored.

Continued on page 32

CASE standards debate rages

Sheer number of proposals hampers users, vendors, organizations

BY NELL MARGOLIS
CW STAFF

With headlines still beating out bottom lines in the booming computer-aided software engineering (CASE) industry, pressure is on for standards to ease users' decisions, protect buyers' investments and boost CASE over the barrier between media phenomenon and legitimate market segment.

Standards are beginning to emerge, according to Jay Prakash, president of Strategic Focus, a Mountain View, Calif., consulting firm that recently completed a study of the CASE market.

But, he added, "It won't happen right away — which is all to the good, since standards can stifle creativity and perpetuate less-than-optimal technology."

Staggering statistics

The sheer number of proposed standards is staggering. Tom Kurihara, who heads a standards subgroup of the Institute of Electrical and Electronics Engineers, Inc.'s (IEEE) Task Force on Professional Tools, last month mailed out a list of standards that could be used in creating an open CASE environment. The list, culled from publications of official standards-making organizations, included more than 200 candidates even without the additional suggestions Kurihara was soliciting.

Beyond the wall of bulk looms the wall of definition. Despite the clamor for standards, according to Anthony I. Wasserman, president of San Francisco-based Interactive Development Environments, Inc., "it's not clear what people want to standardize on. Notation? File format? Conversion methods? All of the above?"

The wide variety of structured analysis and design methodologies now in use, Wasserman added, further slows progress toward standards.

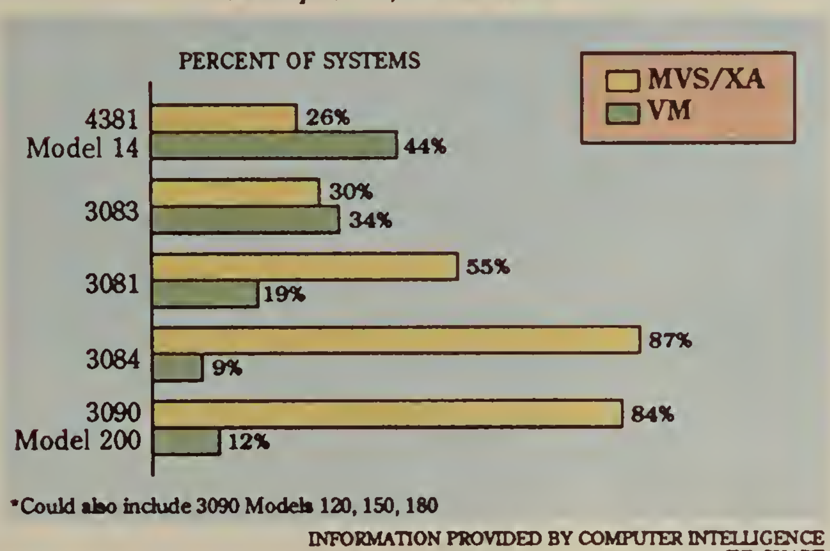
"The problem is obvious,"

Continued on page 29

Data View

IBM MVS/XA and VM usage on progressively larger systems

MVS/XA dominates IBM's high-end mainframes, but VM outstrips MVS/XA on the 3083s



*Could also include 3090 Models 120, 150, 180

INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
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SOFTWARE NOTES

Ingres gets consultants

Relational Technology, Inc. has signed up **Computer Task Group, Inc.** as a preferred certified consulting firm for Ingres, its relational data base management system. By June, 100 Computer Task Group representatives will be certified Ingres consultants and 300 staff members will be knowledgeable in Ingres.

Relational Technology has other preferred consulting firms, but they tend to be active in niche markets. Computer Task Group is more of a general

Continued on page 32

Firm ships testing tool

On-Line simplifies use of Datavantage

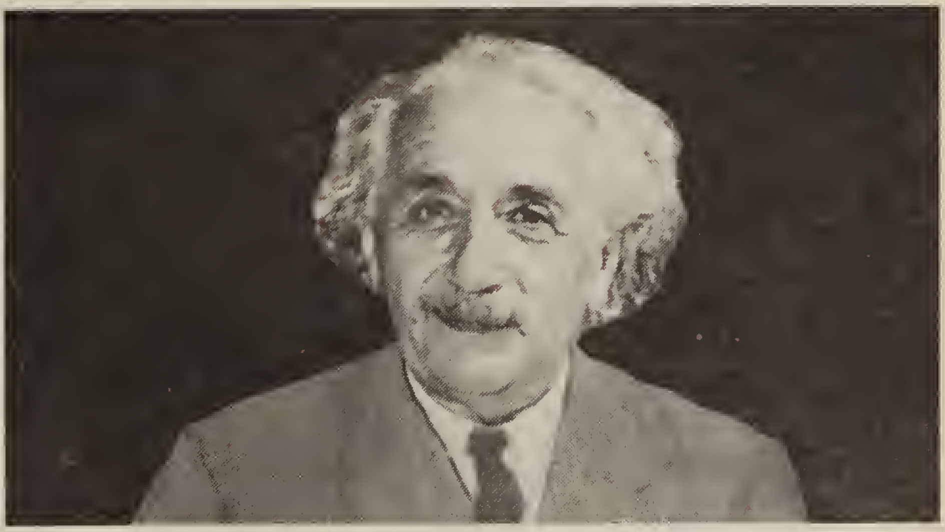
FORT LEE, N.J. — On-Line Software International, Inc. recently began shipping Release 4.0 of Datavantage, a testing tool for IBM's IMS data base management system and for the DL/1 data access language.

With Release 4.0, On-Line has taken steps to make the product easier to use, as customers had requested, according to Bill Pollack, senior vice-president of technology.

On-Line rolled several new features into Release 4.0. For example, users previously had to assign a new name to an IMS program written in Cobol in the Datavantage environment. Users can now transfer the same program name from the data base to Datavantage, Pollack said. Release 4.0 supports field names of up to 30 characters.

Current Datavantage users under maintenance contracts can upgrade to Release 4.0 free of charge. For new users, Datavantage Release 4.0 can be licensed for $19,000 for DOS and $39,500 for IBM's MVS. The product reportedly runs on all IBM 370 hardware as well as plug-compatible machines.

Inside
- DEC draws up PHIGS version for Vaxstations. Page 33.
- Apollo opens box of Ada programming tools. Page 33.



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CASE

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said Dennis Gaughan, manager of environmental development at the Reston, Va.-based Software Productivity Consortium (SPC), a joint venture of aerospace companies aiming to enhance the quality of defense-oriented software. "We have too many standards, and they all contradict each other. The idea is to choose the meaningful ones and put them to work."

The effort to do so is well under way by users as well as manufacturers and official standards-making organizations. For instance, standards are a top priority at both the IEEE and the SPC, which later this month will host executives of 25 CASE firms for brainstorming on the issue.

Several months ago, Providence, R.I.-based CASE product manufacturer Cadre Technologies, Inc. launched a campaign to extend the Electronic Design Interchange Format (EDIF), already a widely accepted computer-assisted engineering standard, into a standard interchange format that would let users share data files and formats among various CASE products. Under the Cadre plan, each participating company would create its own import and export routines to be translated through EDIF.

IRDS on verge of approval

Meanwhile, the American National Standards Institute (ANSI) is reportedly in the final stages of conferring official standard status on the Information Resource Dictionary System (IRDS). Under development since 1983, IRDS is a fully extensible dictionary that describes and manages information resources used by software developers during the application development process.

IRDS defines four separate interfaces, according to David Carpenter, product development manager at Pansophic Systems, Inc. in Chicago and vice-chairman of the ANSI committee that is shepherding the proposed data dictionary through the steps toward standardization.

Posix, the portable operating system definition in progress under the aegis of the IEEE since the early 1980s, was not conceived of as a CASE standard but is expected to function as one nonetheless. "Posix will have a powerful influence on CASE," the SPC's Gaughan said. "Every toolmaker will know in what environment his tools will work."

Posix is based on AT&T's Unix System V Interface Definition; CASE is largely a creature of the workstation environment, which, in turn, is largely Unix-based. "If we can get down to one Unix, or close to it, all the toolmakers will be on the same playing field," Gaughan said. Now pending approval before the International Standards Organization, Posix is expected to become an official international standard within a few years.

While the EDIF initiative is manufacturer-driven and IRDS and Posix are coming from standards-making organizations, users — or, at least, one major user — are clearly the ones responsible for what is rapidly becoming a de facto CASE programming language standard.

"The U.S. Department of Defense wants to see standards, and the DOD — which is paying very big bucks for software — usually gets what it wants," Interactive Development's Wasserman noted. What the DOD wants is Ada, which last year became a requirement for winning defense-related software contracts.

"Ada is definitely a standard in defense-related work," Cadre President David Banks said. What's more, he added, "In this country, and even more so in Europe, it's beginning to penetrate commercial environments."

"Do I want to see CASE standards? Oooh, yes," said Thomas Flecher, senior manager of systems development at Ernst & Whinney. Flecher, who helped introduce CASE tools to his department at the Big Eight accounting firm's Cleveland headquarters, pointed to interfaces among different CASE tools as particularly desirable. "We've been pushing for these standards with our vendors" with some success, he said.

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Inmon

FROM PAGE 25

Consider the problems of archival data. It is bulky. There is usually too much. As a consequence, we often have to store archival data on a nonelectronic medium, such as microfiche.

Archival data, because of its bulk and the medium on which it is stored, is sometimes lost. Once lost, it is never recaptured.

Unlike other forms of data, archival data is stored for unknown future needs.

Archival data is hard to access. Much energy is spent working through the morass that is not of interest to get to the useful data. Furthermore, some archival data needs to be accessed at the individual record level and other data at the summary level.

The use of archival data is often complex because the data is time dependent. Each unit is associated with some moment in time. In some cases, an event triggers a time-variant measurement of archival data. The structure of archival data changes over time. As data is archived, it is prudent to capture not only the content of the data but the structure of it as well.

The challenges of creating and using archival data go on and on. But those challenges are worth addressing. The opportunities for using archival data probably outweigh the difficulties. Some of the potential uses include the following:

- Trend analysis — believable trend analysis — in which many variables may be taken into consideration.
- Demographic analysis — peering into data at a level never before possible. The in-depth analysis that is possible with carefully stored archival data surpasses anything on today's horizon. New insights may be possible where no analyses had ever been done before.

In short, there exists a whole new frontier in archival data. How will the frontier be explored? In a pathological manner? By a well-conceived plan? By an exciting new technology that makes possible entirely new types of processing?

The most likely scenario for successful exploitation of archival data will come from some scientist who develops the Lotus 1-2-3 of the archival world.

The use of archival data depends on the collection and storage of data now, even when there is no obvious need for it. The organization that waits for the use of archival data and the technology to manage it successfully will be a step behind the competition. Positioning for the future requires action now.

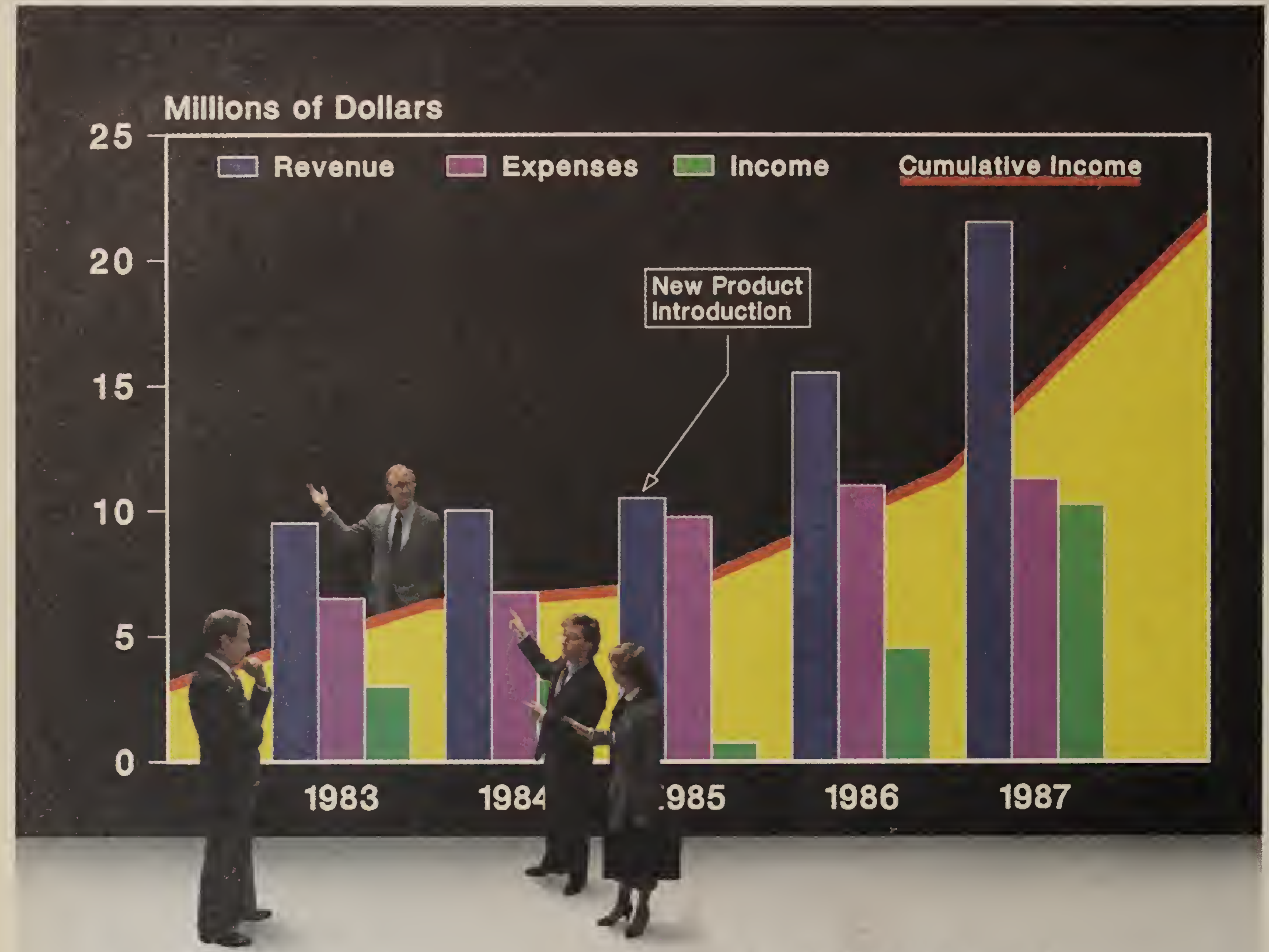
Inmon is a senior principal with American Management Systems in Lakewood, Colo., and an author on the subject of data base design.

Relational

FROM PAGE 25

commercial firm. The move appears to be a way for Relational Technology, with a smaller revenue base, to match Oracle Corp.'s stated intent to establish a staff of 250 consultants.

Two giants formed a quick alliance at the end of 1987. **Digital Equipment Corp.** said it will comarket the Masterpiece series of financial applications, developed by Software International and now part of software giant **Computer Associates International, Inc.** The pact is another sign that DEC has rapidly broadened its Cooperative Marketing Program to get more applications available on VAXs.



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NEW PRODUCTS

Systems software

An implementation of the Programmers Hierarchical Interactive Graphics System (PHIGS), an ANSI draft standard for three-dimensional device-independent graphics software, has been announced by **Digital Equipment Corp.**

VAX PHIGS is made up of a 3-D graphics support system that controls the definition, modification and display of hierarchical graphics data. It is a subroutine library packaged as a set of VMS-shareable images. The product manages the organization and display of graphical data stored in a conceptually centralized data base, according to the vendor.

VAX PHIGS software is supported on DEC's Vaxstation II/GPX, Vaxstation II, Vaxstation II/RC, Vaxstation 2000, Vaxstation 3200 and Vaxstation 3500, under VAX/VMS.

VAX PHIGS can be licensed for $3,500.

DEC, 146 Main St., Maynard, Mass. 01754. 617-897-5111.

An **Interactive Expediter** for the **Prism Navigation System**, an IBM mainframe software package that integrates disparate data bases, VSAM files and dissimilar computers, has been announced by **New Software Corp.**

The enhancement allows the Prism system to automatically expedite data flow and resource allocation by interactively and automatically changing job priorities. Statistical data from within CICS and CICS command modules is used to provide work-flow balancing.

The base price for the Prism Navigation System is $150,000.

New Software, P.O. Box 2118, 3 Mill St., Attleboro, Mass. 02703. 617-226-6662.

An enhanced version of the **Aim Job Scheduler** for Unix system job scheduling and work load balancing has been announced by **Aim Technology, Inc.**

The Aim Job Scheduler manages the system job mix and monitors the system job load. It provides reports on program usage and can adjust the job mix in response to changing system use. The enhanced version offers a simplified procedure for setting and modifying job limits.

Pricing ranges up to $15,800, depending on the type of system.

Aim Technology, Suite 203, 3350 W. Bayshore Road, Palo Alto, Calif. 94303. 415-856-8649.

Applications packages

Quant Systems has ported its **Unix Statistician** to The Santa Cruz Operation, Inc.'s SCO Xenix 286 and 386 as well as Unix.

The vendor said the statistical, graphical and quality-control program has also been enhanced to accept a range of data formats such as direct input, including user-defined ASCII records, DIF, ASCII columns and Unix Statistician formats.

Pricing for the Unix Statistician is hardware dependent. It starts at $750.

Quant Systems, P.O. Box 628, Charleston, S.C. 29402. 803-571-2825.

A problem-solving environment and theorem prover with an automated reasoning system has been announced by **Conversion Systems, Inc.**

Called **Tprover**, the interactive system is said to be capable of using artificial intelligence to solve such problems as advanced mathematical theorems. According to the vendor, Tprover contains a Hewlett-Packard Co. Prolog-like subsystem for unlimited expandability.

Tprover runs on Unix System V and Unix 4.23 and Digital Equipment Corp. VAX VMS and IBM CMS systems. Costs range from $2,500 to $12,000.

Conversion Systems, P.O. Box 597190, 3401 W. Devon Ave., Chicago, Ill. 60645. 312-390-8849.

Utilities

VSAM/Editor, a full-function on-line VSAM editor, has been announced by **MB & Associates.**

According to the vendor, the product lets users browse, retrieve, add, modify or delete records on any VSAM file online under IBM's CICS or TSO.

VSAM/Editor is priced from $3,900.

MB & Associates, Suite 200, 7921 S. Park Plaza, Littleton, Colo. 80120. 303-794-1740.

Development tools

Apollo Computer, Inc. has introduced the **Domain/Ada Development System**, a set of tools for the development of programs written in the Ada programming language.

The system consists of the Ada compiler, a source level debugger, program library management tools, a runtime system and program-development utilities. It is said to be compliant with the U.S. Military and ANSI Ada standard.

Features include access to Apollo Domain system facilities and user-written routines in Pascal, Fortran 77 and Domain/C; low-level representation clauses to allow control over data layout; and compiler error messages.

Domain/Ada is priced at $6,000.

Apollo Computer, 330 Billerica Road, Chelmsford, Mass. 01824. 617-256-6600.

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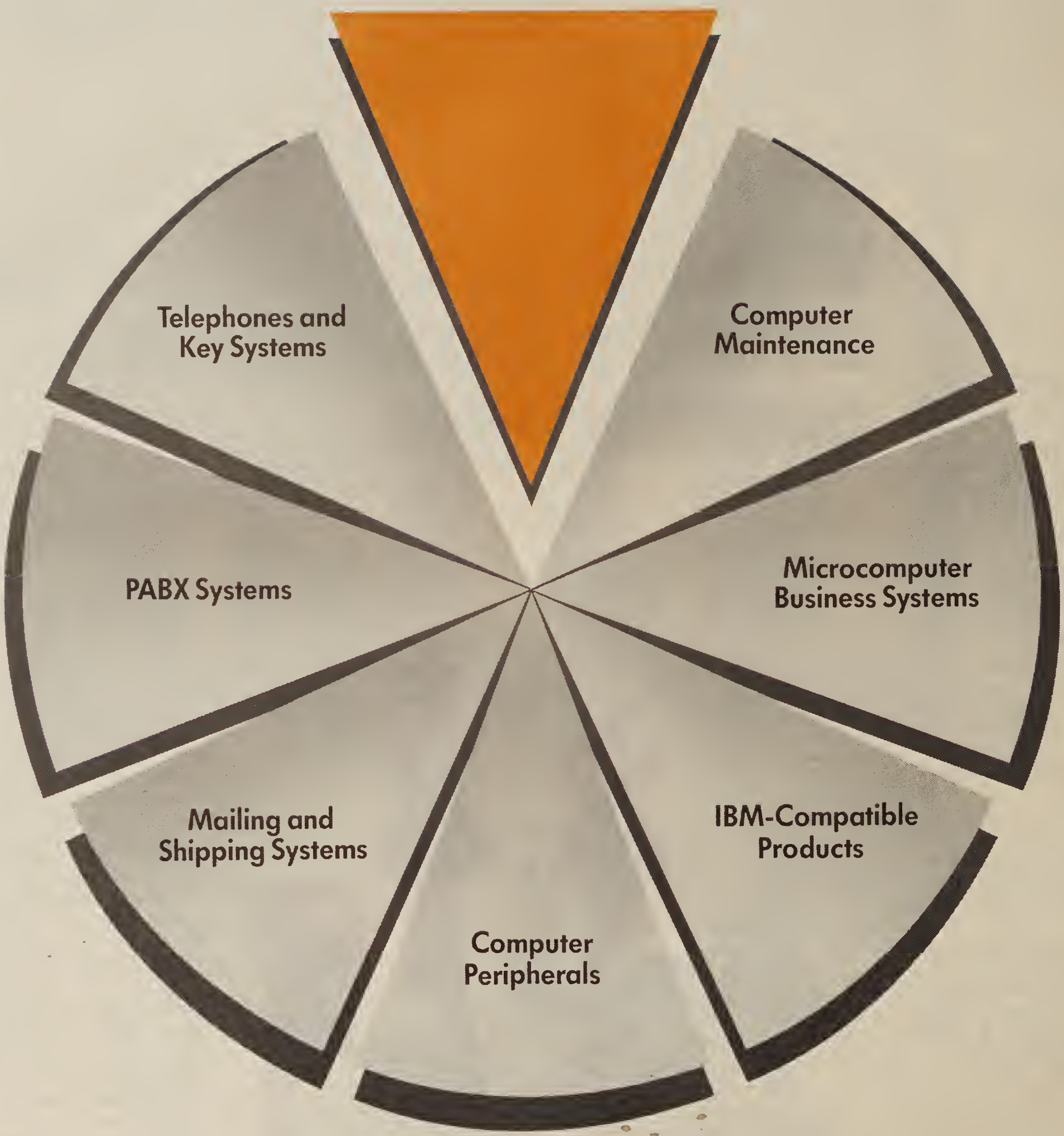
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Ed Scannell

Point man leaves Javelin

Javelin blunted. Chris Herot, who was a major technical influence in shaping Javelin's innovative financial modeling package, left the company last month. His departure came at an inopportune time for the financially troubled company, which is seeking venture capital to fund delivery of products it announced in November 1987, as well as new projects.

Herot says all the company's engineers had left the payroll by the end of December 1987, although a few have stayed on as consultants. "It's not like they don't have any [engineers], but people would rather have money than stock," Herot says.

An important reason for the engineers' departures is that the projects Javelin had lined up for this year may have been interesting from a marketing standpoint but weren't innovative enough to keep a highly talented group of people together. "The [Javelin engineers] I had there were real super. There were just five guys who built the whole product," Herot says.

Likewise, Herot says, his decision to leave was prompted by

Continued on page 42

Unprotected Symphony tunes up

BY ED SCANNELL
CW STAFF

CAMBRIDGE, Mass. — Symphony lost its copy protection scheme last week, but it may have found a lot of new friends — some of whom are in high places.

Lotus Development Corp. unveiled Version 2.0 of the five-function program last week. The update is said to allow users to load Symphony onto a hard disk to be shared on a network and to move data more easily from 5¼- to 3½-in. disks.

The lack of copy protection also makes the integrated program a more viable contender for government contracts. The government requires that all software up for bids be unprotected.

Lotus is the last of the major software vendors to remove copy protection, something for which many users and analysts have long criticized the company. The complaints and criticism, however, have not damaged the program's sales much.

Analysts universally agreed that Symphony remains the best selling five-function program. The product accounted for 40% of Lotus's sales last year, according to Donna Simonides, Symphony's product marketing manager.

Analysts have long speculated that the days of five-function programs have been numbered and that owning this market as Lotus has will eventually not count for much. Simonides, however, said she sees Symphony as a long-term player with a solid future in both the Microsoft Corp. MS-DOS and IBM OS/2 environments.

"Symphony is a viable OS/2 product. However, there are no plans now to have a Symphony-G [like Lotus's 1-2-3/G] with a graphical interface," Simonides said.

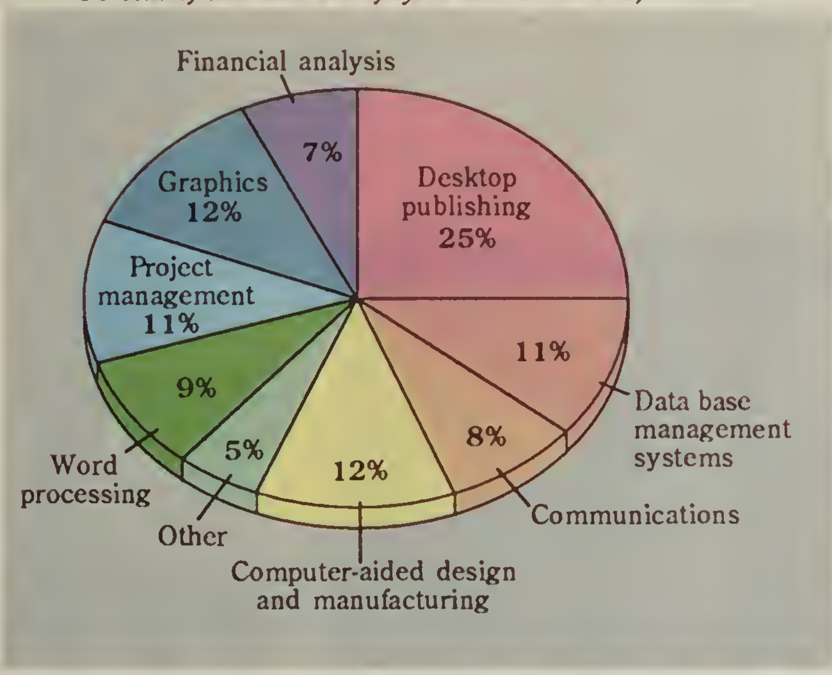
Simonides declined to say, however, when an OS/2 version

Continued on page 44

Data View

PC processing plans

Percent of intended use of systems at Fortune 1,000 sites



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE

Lotus flop jazzed up

BY JULIE PITTA
CW STAFF

SAN FRANCISCO — Lotus Development Corp. last week took a second shot at the market in which it experienced what many observers agree was its biggest failure. The company introduced a follow-on to its 3-year-old Jazz integrated business package for the Apple Computer, Inc. Macintosh, adding many features that users asked for in the early releases of Jazz and retaining the product's name.

Modern Jazz represents what officials said is a renewed com-

Continued on page 43

DG system strides into publishing

BY ALAN J. RYAN
CW STAFF

WESTBORO, Mass. — Trying to establish a foothold in the corporate desktop publishing market, Data General Corp. has announced a system that allows resources to be shared on personal computers, departmental processors and mainframes.

The company also announced a marketing agreement with Xerox Corp., enhancements to its CEO office automation software and a laser printer.

The CEO 3.0 Desktop Composer package, which works on a DG Dasher/286 computer and on the IBM Personal Computer XT, PC AT and compatibles, incorporates Xerox's Ventura Publisher 1.1 software, customized by DG for its systems. Ventura Publisher has been integrated with CEO and networking software by DG, according to J. David Lyons, DG's vice-president of group marketing.

Continued on page 42

Inside

- Egghead president speaks out on cracking corporate America. Page 39.
- IBM PC Convertible not everybody's favorite ragtop. Page 39.
- Western Computer adds 386-based PC. Page 45.

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338803-0

SMALL TALK

William Zachmann

Tablet eases art ache

With Microsoft Corp.'s Windows 2.0 and Windows 386, not to mention the Presentation Manager, the world of IBM Personal Computers and compatible systems is moving rapidly toward the graphical user interface. Windows, scroll bars and dialogue boxes will soon be standard features of IBM PC-compatible systems.

Conceived at the Stanford University Research Institute and developed at Xerox Corp.'s Palo Alto Research Center, the graphical user interface was first made popular by Apple Computer, Inc.'s Macintosh. Apple cofounder Steve Jobs turned some of the best theoretical work in computer science into usable products.

A key element of the graphical user interface is the pointing device. The intent of Doug Engelbart, inventor of the cursor control device, was to have users simply point to things on the display. This opened the door for many of the ease-of-use features that have made the Macintosh so popular.

Engelbart's invention is an essential element of the Macintosh. With the growing acceptance of Windows, which will accelerate significantly once the Presentation Manager is shipped later this year, mouse cursor control devices are rapidly penetrating the IBM-compatible world.

Long before anybody sold a mouse cursor control device for personal computers, however,

Continued on page 44

'Eggspert' achieves success by coddling users, cracking corporate America

When it comes to microcomputer software, Victor Alhadeff doesn't mind being called an "eggspert." As founder and president of Egghead Discount Software, Alhadeff has woven the egg-word into a myriad of successful software promotions while winning over the hearts and pocketbooks of both consumers and corporate customers.

Corporate America has become an increasingly important piece of the Bothell, Wash.-based software chain's business. In the last year, Egghead has more than doubled the size of its corporate and governmental sales force to 120 people.

Today, with 102 stores scattered across the U.S., Alhadeff has a foot planted on each side of the software path — one with the manufacturers of today's biggest selling programs and one with users seeking quality at bargain prices. He recently shared his opinions on the corporate marketplace and future directions of software with *Computerworld* West Coast correspondent Stephen Jones.

IN PERSON

What are the biggest challenges facing corporate users today?
Finding a reliable vendor that can keep up with their needs in terms of the multiplicity of new versions, availability for networks and upgrades to the OS/2 environment. They need support for that transition, and with the increased use of Apple Macintoshes, users need to be informed of what is available on the Mac.

Alhadeff *delights in seeing corporate customers shell out for his low-cost Eggcessories.*

What trends do you see in the corporate environment at this time?
There are two trends. At one end of the bell curve is the power user whose demand for memory and power is insatiable; thus the success of Microsoft's Excel and Intel 80386 machines. At the other end is the PC user who is not technically proficient and requires products that are heavy on ease of use. It's important for a vendor to tailor solutions to meet the needs of both groups.

What vendors are able to appeal to both?
Microsoft Works is a phenome-

Continued on page 43

PC Convertible: Too little too late?

IBM laptop's shortcomings criticized by some; others say they're satisfied

BY JAMES A. MARTIN
CW STAFF

Since its debut in April 1986, IBM's PC Convertible has been widely criticized as being too little too late.

Users and analysts complained first and loudest about the original Convertible's black-on-white LCD that IBM said was designed with a special bonding process to reduce glare. At that time, competitors such as Zenith Data Systems Corp. were already using a much-improved backlit LCD screen. In fact, Zenith won several key federal government contracts because its overall laptop technology was considered more advanced than IBM's.

IBM has enhanced its display twice, first with a supertwist LCD in January 1987 and then with the long-awaited backlit LCD last April.

"We disliked the original display intensely, and by the time they came out with the third display, we were already heavily committed to other laptops," said Bruce Johnson, manager of the PC Resource Center for Deloitte Haskins & Sells in New York, which has about 1,600 portables and laptops.

PC Convertible

Price: $1,695

- 80C88 CMOS microprocessor
- 4.77-MHz speed
- MS-DOS Release 3.2
- Two 720K-byte 3½-in. microfloppy disk drives
- 256K-byte memory expandable to 640K bytes
- Supertwist or backlit LCDs with 25- by 80-pixel resolution; can be detached for desktop display

The PC Convertible offers the advantage of removing the portable display in favor of a larger CRT monitor, enabling the user to transform the laptop into a desktop machine. Although several users queried by *Computerworld* said this was an interesting option, it was not rated as an important one.

The PC Convertible's expansion limitations, lack of a hard disk drive and small keyboard make it an unattractive full-time desktop machine for most applications, according to users and analysts.

On a scale of 1 to 10, the PC Convertible rates about a 6, according to Tim Bajarin, executive vice-president of Creative Strategies, Inc., a consulting firm in Santa Clara, Calif. "The original LCD screen was ridiculous, but the keyboard is still not as ergonomic as other competitive models, and there's no hard disk. The only strength I see in the product is the IBM name," Bajarin said.

Although most analysts said the laptop market has yet to take off, the figures show that a few companies — Toshiba Corp., NEC Corp., Zenith and Tandy Corp. — are doing brisk business in that area. Cupertino, Calif.-based Infocorp estimates

Continued on page 42

Apple taps into desktop niche with new printers

BY JULIE PITTA
CW STAFF

SAN FRANCISCO — Apple Computer, Inc. last week renewed its commitment to the desktop publishing market and bolstered its embryonic efforts in the desktop presentations market with an upgrade of its printer technology.

As expected, Apple rolled out three laser printers to replace its existing Laserwriter and Laserwriter Plus printers at Macworld last week.

Not only does Apple intend to strengthen its presence in desktop publishing — the vehicle that initially launched it into the Fortune 500 — and presentations, but it is also trying to claim a slice of the Microsoft Corp. MS-DOS world with its lowest cost printer ever.

All three printers use Canon U.S.A., Inc.'s LBP-SX engine and offer 300 dot/in. resolution. According to Apple officials, the engine offers up to four times the performance speeds of existing Laserwriter printers and a print life of 300,000 hours, compared with 100,000 hours for the Canon engine used in the existing Laserwriter line. Apple's new printers are upgradable through the addition of controller boards.

At the low end of the line, Apple introduced its single-user Laserwriter SC, which is priced at $2,699 and based on Motorola, Inc.'s 68000 processor. It offers 1M byte of random-access memory and 8K bytes of read-only memory (ROM).

Price appeal

"It's a way to get to customers who didn't go to the Laserwriter because of the cost," said James Gable, product manager for Apple's new printer line. "It puts Apple on a more equal basis with DOS printers. It's not a great machine if you want to do whizzy desktop publishing."

Expected to be the strongest seller in the line, the Laserwriter SC is scheduled for availability in early February.

Apple's mid-range printer, the Laserwriter NT, was designed as a replacement for the Laserwriter and Laserwriter Plus. Priced at $4,599, the printer is based on the Motorola 68020 processor and offers Adobe Systems, Inc. Postscript capabilities. It provides 2M bytes of RAM — compared with 1.5M byte for the current line — and 1M byte of ROM. Availability is scheduled for early February.

Apple's high-end printer, the Laserwriter IINTX, is priced at $6,599 and is also based on the 68020 processor. However, it adds more RAM, ROM and hard disk drive capabilities.

It offers 2M bytes, expandable to 12M bytes, of RAM and 1M byte, expandable to 2M bytes, of ROM. A 20M-, 40M- or 80M-byte hard disk drive can be connected to the printer. Apple officials said the Laserwriter IINTX was designed to support large networks of personal computers, Apple Macintoshes and MS-DOS-based systems. Availability is set for late February.

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COMPAQ®

Scannell

FROM PAGE 37

the diminishing prospect of managing a large engineering group that would create a raft of bold and exciting products.

Herot admits Javelin simply couldn't move its innovative technology to the bottom line. "We built this wonderful product that everyone said was better than anything out there, but even our friends in corporate America couldn't get management to buy something different" than Lotus's 1-2-3, he says.

One thing that may have held Javelin back was ego, Herot says. In retrospect, he says, he thinks the company was a bit too full of itself in believing it could overtake Lotus.

"It was probably a thing the venture capitalist talked us into. If you want to raise a lot of money, you have to tell them you are going to become a big-time software company. Then you start to believe the story yourself," he says.

Herot agrees that Javelin should have positioned its software as a high-end package priced at $1,000 or more, not as a mass-market product competing with 1-2-3. But the company moved in the opposite direction by dramatically discounting the program to $99.95 — albeit on a temporary basis. The promotion was successful, selling about 30,000 copies of the program and generating more than $1 million in revenue. But it couldn't hope to serve as a long-term fix.

It would be a shame to see an interesting and well-designed product like Javelin die without getting a second chance. Maybe the company's guardian angel has some pull with the Big Guy. Or better yet, maybe the Big Guy has some pull at one of the major software companies.

Scannell is *Computerworld*'s senior editor, microcomputing.

DG

FROM PAGE 37

Xerox has licensed DG to market a version of Ventura Publisher in a three-year OEM contract.

DG has combined CEO Desktop Composer with its existing line of publishing packages. They will target corporate publishing needs in banking and financial services, insurance, manufacturing, government and the petrochemical industries.

The CEO Desktop Composer will be configured in three packages. The basic software package, including the CEO Desktop Composer, MS-DOS CEOwrite 2.00 and CEO Connection Revision 3.10 will sell for $1,640. The peripherals package adds a mouse and a 15-in. full-page monochrome monitor to the software for $3,090. The Workstation package includes the software, peripherals and a DG Dasher/286 computer with 640K bytes of memory and a 20M-byte hard disk. It will sell for $6,460.

All the products are available for shipment 60 days after receipt of order.

Convertible

FROM PAGE 39

that some 107,000 units of the Toshiba 1100 series laptops have been shipped worldwide since their 1985 debut, compared with 95,000 Zenith 181 and 183 models. Comparatively, Infocorp counted 46,000 PC Convertibles shipped to date. "There are simply too many other more desirable choices for the consumer," said Abbi Lawrance, a laptop analyst for Infocorp.

IBM has reportedly seen the light, insiders say, and is expected to introduce in April an Intel Corp. 80286-based PC Convertible with a 20M-byte hard disk drive and a gas plasma display screen. An IBM spokesman would not comment on future products.

For certain applications, some users said the current PC Convertible is the machine of choice. At The Prudential Insurance Company of America, for example, some 7,000 to 8,000 PC Convertibles were purchased by the company's agents for making sales calls.

Plug in Ventura and all these play.

You're probably well aware that Xerox Desktop Publishing Series: Ventura Publisher Edition, is, as industry and computer magazines put it, the clear leader in the MS-DOS publishing world. *But,* will it plug and play with your equipment and software, or with the equipment and software you intend to buy?

As you can see below, the answer is yes, 185 times yes. Xerox Ventura Publisher is compatible with more word processing, more graphics packages, and more peripheral options than any other PC publishing program. It runs on a standard IBM XT/AT or compatible—286 or 386 technology; and *does not*

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- Linotronic 100 and 300 typesetters
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- QMS PS2400
- Tall Tree Systems J Laser™
- TI OmniLaser 2108 and 2115
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Word Processor Compatibility

- All ASCII files
- IBM Displaywrite® 3
- Lifetree Volkswriter 3™
- Office Writer™
- Micropro Wordstar 2000
- Samna Word™
- Lotus Manuscript™
- Microsoft Word™
- Ashton-Tate Multimate Advantage™
- Microsoft WindowsWrite™
- Satellite Software Wordperfect™
- Micropro Wordstar® 3.3, 3.4
- Xerox Writer™
- Xywrite™

Graphic Software Compatibility

- AutoDesk AutoCad® (SLD format)
- Computer Graphics Metafiles
  - 20/20—Access Technology, Inc.
  - A/GRAPH—Donovan Data Systems, Inc.
  - Allspice—Acotech
  - Apollo—ABA Groups, Inc.
  - ARC—Architecture and Computer Aids
  - ASI Font System—Analytical Software
  - Business Strategist—Reality Development Corporation
  - Business Simulator—Reality Development Corporation
  - CADTEC—Itautec Information S/A
  - Cadwrite—IBM
  - CASE Manager—Computer Aided Structural Engineering, Inc.
  - COGO Pac—Maptech, Inc.
  - Concept 100—Concept Technologies
  - Custom/QC—Stoohos, Inc.
  - DaVinci Business Graph
    Professional Re
    Consulta
  - Display
    ISSC
  - ESTIMA
    Tipnis, I
  - Excalibur—
    Dynamics
  - Fortegraph A
    Communica
  - Freelance—Lot
    Corporation
  - FrontPage—Stud
  - GAF—Simulation
  - GPOS-7—Planmet
  - GRAFTIME—Geni
    Corporation
  - Graph 6 Application L
    Facility—Honeywell
  - Graphics Operating Sys
    University of Texas
  - Harvard Presentation Gra
    Software Publishing
  - Hornet 5000—Claremont C
  - IRMAGRAF—Eastman Kod
  - LABTECH NOTEBOOK—Laboratory Technology Corporation
  - LARSA—Innovative Analysis, In
  - LLCOGO—Lewis and Lewis
  - MathPlan 3.0—Wordperfect Corporation
  - Matrix-X—Integrated Systems, Inc.
  - Mavis—Robinson Associates, Inc.
  - Metal Building Program—International Structural Engineers
  - Micro Cadam—CADAM, Inc.
  - MicroCAD—Imagimedia Technologies
  - MicroCUBE—McDonnell Douglas
  - MicroTrak—SofTrak Systems
  - OPTEC—Sciopt Enterprises
  - Opus—Optim Electronics
  - PC Link A Graph—ISSCO
  - PC-DCE—CA Systems International, Inc.
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Jazzed up

FROM PAGE 37

mitment to the Mac market. "We have never stopped writing code or marketing products for the Mac," said Pam Campagna, product marketing manager for Modern Jazz.

Many observers questioned Lotus's ability to compete in the Macintosh market after Jazz debuted more than three years ago to disappointing reviews and sluggish sales. Widely criticized for its $595 price and lack of a macro programming language, the product sold 115,500 copies, according to Cupertino, Calif.-based Infocorp. That was well below Lotus's expectations.

Modern Jazz, which is priced at $395 and is set to be available later this quarter, combines the Jazz functions of work sheet, graphics, data base, forms generation, word processing and communication.

Major new features include Hotview, which provides a data integration function, a macro command language and a memory management system with features like sparse-matrix memory management, minimal recalculation and use of all available random-access memory.

Bill Higgs, director of software services at Infocorp, called Modern Jazz "a substantial change for the better." The package runs on Macintosh Plus, Mac SE and Mac II computers with at least 1M byte of random-access memory. Current customers of Jazz 1.0 and 1A can upgrade to Modern Jazz for $95.

Eggspert

FROM PAGE 39

nal program for first-time users, and Excel and [Microsoft's] Word are great at the high end. Software Publishing also appeals to first-time users with its PFS series and to more sophisticated users with its Harvard line.

What is going to be the hot software application in 1988?
There isn't going to be a new category emerging like desktop publishing did. If you go out a year from now, CD-ROM will emerge as an important area, with software being written for it. There is also going to be a tremendous growth of network software and networked versions of current applications.

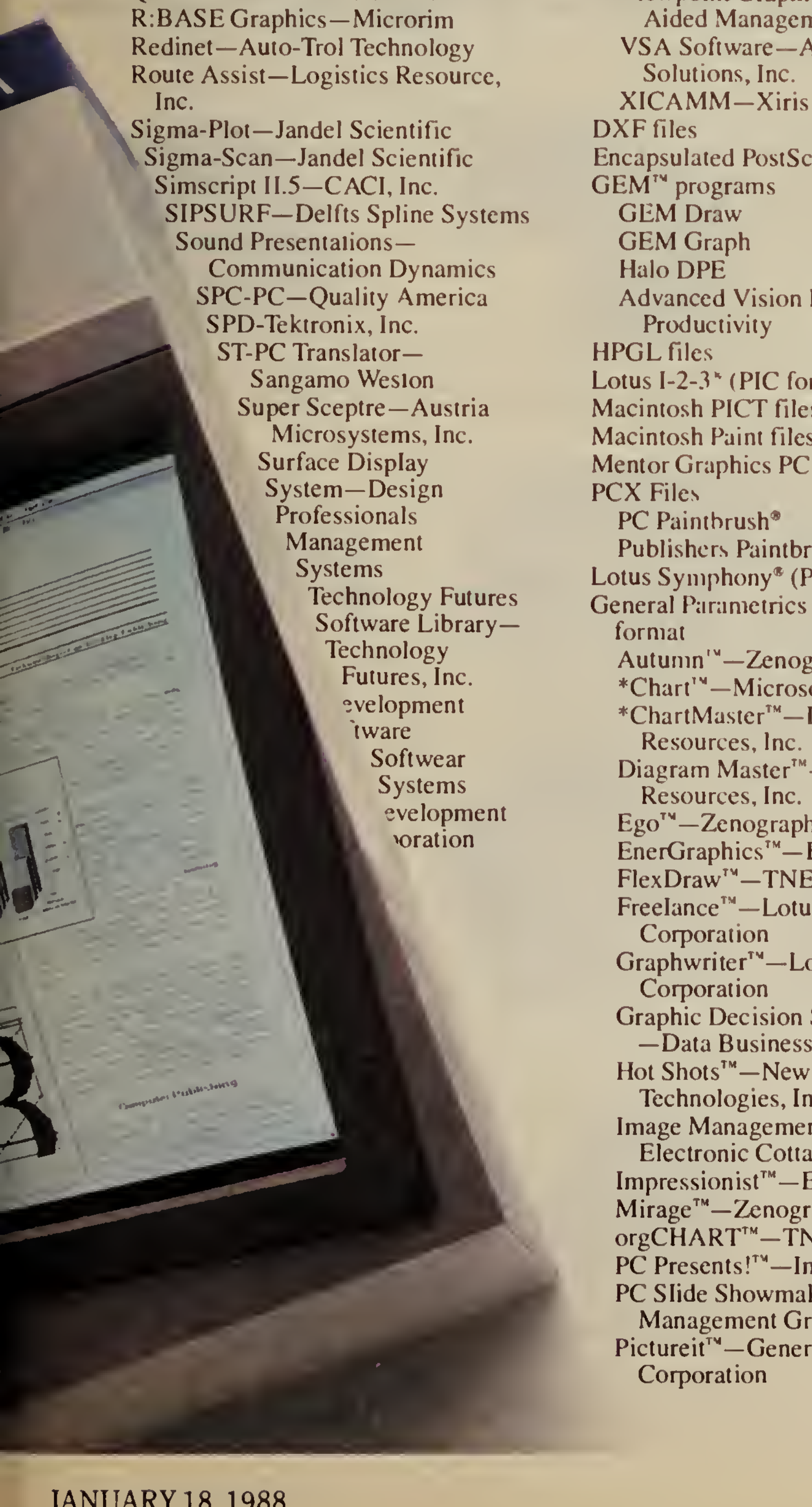
Is information management software, such as Lotus's Agenda, as helpful and necessary as some vendors claim?
I don't think it's a breakthrough. It's nice, but not of the stature of a whole new category of software. It's really just a refinement of a data base manager. In and of itself, it's not a reason to buy a computer.

How important is connectivity to your customers?
Today, it's marginally important. As it is tested more and more, it will become a major factor this year and a gigantic factor next year, especially with OS/2, the Presentation Manager and Windows creating the common user interface.

With the Big Three micro software vendors gaining so much clout, is there still room on retailers' shelves for products from smaller, less known developers?
At Egghead, we pride ourselves on being at the forefront of new applications from new developers. But most hardware vendors are only going to carry the Big Three, and that creates problems for the new companies.

Will software prices continue to climb as functionality improves?
No. They'll stabilize with increased value. When Borland comes out with Quattro and has phenomenal functionality at a reasonable price, that sends a message that other companies can't ignore: You just can't continue to raise prices.

Do you think Fortune 1,000 companies are less price-sensitive than others?
From our perspective they're amazingly price-sensitive, but they are also looking for reliable vendors who will be there tomorrow to provide service and support.



XEROX

require XT power. It is also the first desktop publishing program to support all industry-standard page-description languages, including PostScript and Interpress. That means total compatibility with all popular laser printers, including, of course, the Xerox 4045 Laser CP and the Xerox 4020 Color Ink-Jet Printer.

The bottom line? You can choose the clear leader in MS-DOS desktop publishing without clearing out your software and hardware investments.

Team Xerox. We document the world.

For more information about Xerox Ventura Publisher call us at 1-800-TEAM-XRX (1-800-832-6979) or clip the coupon below.

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Sigma-Plot—Jandel Scientific
Sigma-Scan—Jandel Scientific
Simscript II.5—CACI, Inc.
SIPSURF—Delfts Spline Systems
Sound Presentations—Communication Dynamics
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SPD-Tektronix, Inc.
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Zachmann

CONTINUED FROM PAGE 39

other types of pointing devices were widely used in specialty applications on traditional mainframe and, more typically, minicomputer systems.

Perhaps the most important of these were graphics tablets. Developed during the 1960s as customized devices for the government, graphics tablets became generally available as standard commercial products in the early 1970s.

A mouse provides an excellent, low-cost pointing device. It should not be taken for granted, however, that the mouse is the best pointing device for all users. There are many instances in which a graphics tablet would be much better.

A mouse is a relative pointing device. The movement of the mouse over a surface is detected by the transducers in the mouse itself and converted into an electrical signal to the adapter card or serial port on the system. Appropriate software then translates this into the movement of a cursor on the screen.

This is an inexpensive way to make a pointing device, since the mouse is quite simple. It uses either a rolling ball or light reflected off a special surface. It is, however, a rather imprecise method.

Tablet better for precision

In situations in which precise cursor positioning or the ability to do freehand sketching is desired, a graphics tablet is an alternative worth considering.

This option is made especially attractive by products like Summagraphics Corp.'s Summasketch line, available in three versions: Summasketch, priced at $449; Summasketch Plus, priced at $599; and Summasketch Professional, priced at $999. All three products embody Summagraphics' 16-year history as a leading supplier of high-quality graphics tablets.

The three differ primarily in size, offering 6- by 9-in., 12- by 12-in. and 12- by 18-in. surfaces, respectively. Summasketch Plus, which I tested, comes with a pen-like stylus, a four-button "puck" with a cross-hair positioning lens and cables to connect with an IBM PC AT-styled parallel port and mouse emulation software.

Summasketch Plus is an appealing alternative to a mouse just for basic cursor control. I'm sure many users will find a graphics tablet preferable to a mouse simply as a matter of personal taste. Where the graphics tablet really stands out, however, is in applications in which its precision and superior freehand sketch capabilities can be fully utilized.

Summasketch is vastly superior to a mouse in any computer-aided design, architectural or mapping application. Offering resolution of up to 1,000 line/in. and accuracy within 0.025 in., it is an essential device for tracing or digitizing.

Serious desktop publishing is yet another application in which the additional precision of Summasketch makes it a much better alternative than any mouse.

Installation is straightforward. Summasketch is widely supported by software that can make use of its capabilities. Mouse emulation software and Microsoft Windows drivers provided with the product will fill in the rest.

Zachmann is vice-president of research at International Data Corp.

Symphony

CONTINUED FROM PAGE 37

will be available, indicating it will be later rather than sooner. "I think we have some time [to get an OS/2 version done]. We expect a slow migration [among Lotus users] to OS/2," she said.

One of the most important reasons for Symphony's continued success is the cost savings it represents, according to Simonides. She said that customers still like the idea of buying an integrated package instead of buying five individual applications.

"Besides cost, they still like the ability to exchange data," she added.

Most of the improvements made to the program were made to the word processing module. They include the ability to automatically reformat paragraphs and to store and paste text. Page orientation has also been made easier.

Changes to the spreadsheet include the following:

- Minimal recalculation, which limits recalculation to cells affected by changes to the worksheet.
- Global zero repression, which displays spreadsheet cells with a value of zero as blank.
- The option of using parentheses or a minus sign to display negative currency.

Lotus upgraded the program's data base by allowing form fields to be edited and the communications module by adding Digital Equipment Corp. VT100 terminal emulation support.

To help its customers better evaluate Symphony 2.0, Lotus is making available Preview Kit, which details the new features of the product and provides information about compatibility, training, upgrades and product support.

Like the three previous versions of the product, Symphony 2.0 is priced at $695. Users of Releases 1.1 and 1.2 can upgrade for $95, while Release 1.0 users must pay $150. Customers purchasing Release 1.2 within 30 days of the shipment of Release 2.0 can upgrade free of charge.

Lotus will make Release 1.2 available for another 180 days after the shipment of Release 2.0, which is expected to be by the end of next month.

Inside the
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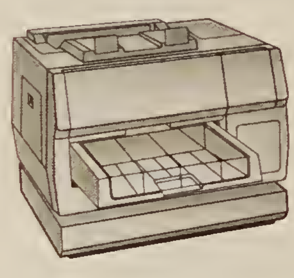
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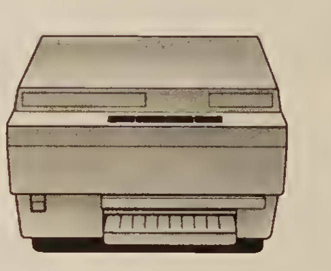
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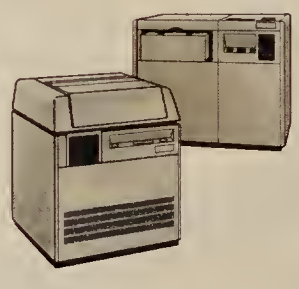
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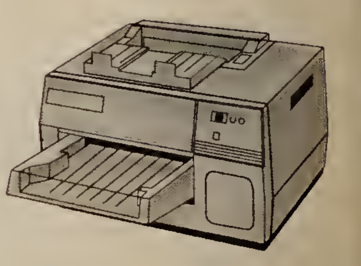
Linotype Company Linotronic™ 300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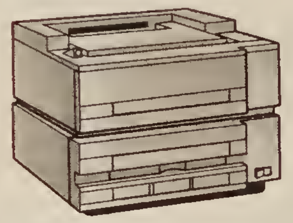
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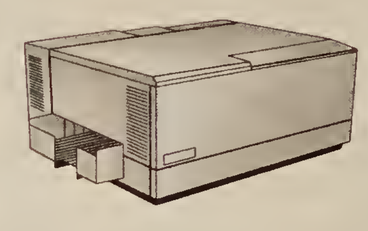
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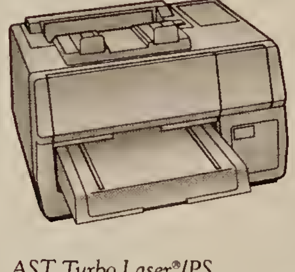
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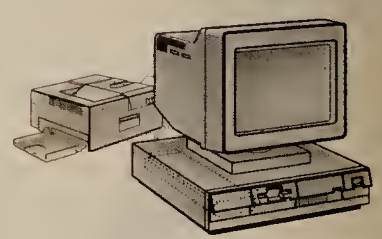
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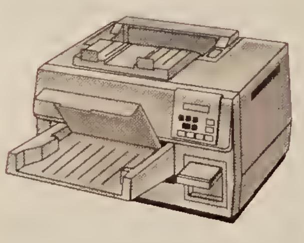
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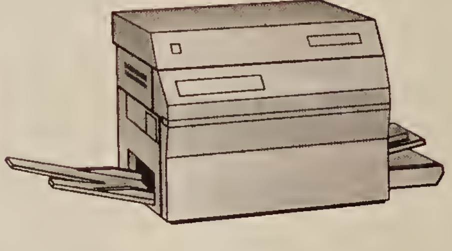
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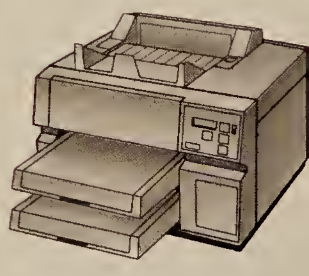
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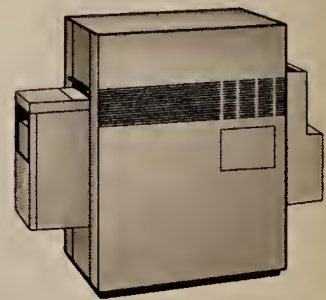
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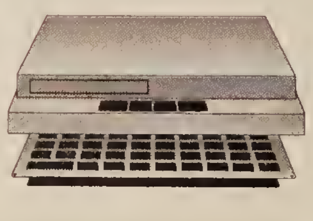
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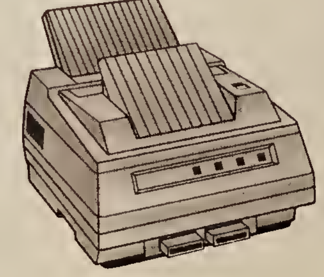
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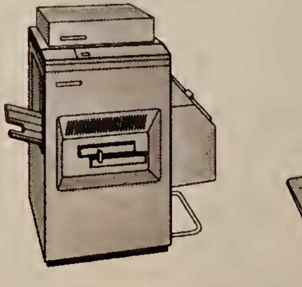
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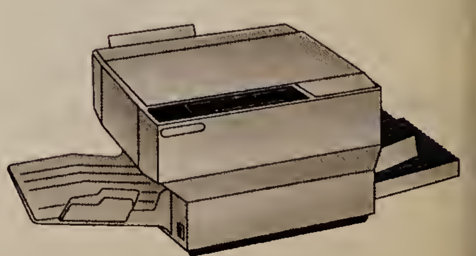
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NEW PRODUCTS

Systems

An Intel Corp. 80386-based personal computer has been announced by **Western Computer, Inc.**

The **Western 386 Advantage II** features 20-MHz operation speed. It is configured with 1M byte of 32-bit random-access memory, expandable to 10M bytes; eight expansion slots; one 1.2M-byte floppy disk drive; and a 200W-power supply.

The 386 Advantage II costs $2,495.

Western Computer, 17781 Mitchell St., Irvine, Calif. 92714. 714-553-1611.

GW Instruments, Inc. has announced **Macintosh SE Expansion System**, a data acquisition and control hardware front end for the Apple Computer, Inc. Macintosh SE.

Designed for use in industrial control and scientific data-acquisition applications, the expansion system measures the voltage potential output by sensors that convert stimulus information to voltage.

The system costs $1,890, including the vendor's Macadios II data acquisition card.

GW Instruments, P.O. Box 2145, 264 Msgr. O'Brien Highway, Cambridge, Mass. 02141. 617-625-4096.

NEW AT MACWORLD EXPO

Compatible Systems Corp. announced **Anytext** and **Anygraph**, IBM Personal Computer to Apple Computer, Inc. Macintosh data translators designed for use in conjunction with Apple File Exchange.

Anytext provides universal translation from any IBM PC-compatible application's text output into Macwrite format. Anygraph provides universal translation of both bit-mapped graphics output and IBM Color Graphics Adapter screen dumps into Macpaint format.

Anytext and Anygraph are available for $95 each. Compatible Systems, P.O. Drawer 17220, Boulder, Colo. 80308. 303-444-9532.

A utility for use in developing small computer systems interface (SCSI) hardware and software for the Macintosh was announced by **Arborworks, Inc.**

SCSI Tool allows users to create, edit and execute SCSI commands. Commands may be entered using hexadecimal or binary code. Also included is a programming language.

SCSI Tool costs $175. Arborworks, 1810 Sunrise St., Ann Arbor, Mich. 48103. 313-747-7087.

A six-port gateway designed to connect non-Apple peripherals to Appletalk networks was announced by **Synaptic Technologies, Inc.**

The **ST3** gateway performs user-supplied polling protocols, device-specific data edits and handshaking transparently to applications. It supports 64K bytes of programmable read-only memory and up to 1M byte of downloadable user-supplied applications.

The ST3 costs from $1,495. Synaptic, Suite C106, 16 Hughs, Irvine, Calif. 92718. 714-859-0570.

The **Model 1260S Ministreamer** nine-track tape drive for the Macintosh family of personal computers was introduced by **Qualstar Corp.**

The drive attaches to the SCSI port and offers 250M bytes of storage on an IBM-compatible 10½-in. tape reel. It maintains a constant data rate of 80K byte/sec.

The Model 1260S costs $7,995. Qualstar, 9621 Irondale Ave., Chatsworth, Calif. 91311. 818-882-5822.

An enhanced version of the **Macvision** video digitizer for the Macintosh was introduced by **Koala Technologies**, a Pentron company.

Macvision 2.0 includes such enhancements as the ability to produce screen and printer images with 256 gray shades and output files in such formats as tagged image file format, Adobe Systems, Inc.'s Encapsulated Postscript and a standard Macpaint format.

Macvision 2.0 costs $399. Koala Technologies, 269 Mt. Hermon Road, Scotts Valley, Calif. 95066. 408-438-0946.

A Fortran compiler that offers numerical computation power for the Macintosh II was announced by **Language Systems Corp.**

The **Language Systems Fortran** implementation supports Standard Apple Numeric Environment (SANE), Apple's implementation of IEEE Standard 754 for binary floating-point arithmetic. It also supports the ANSI-standard Fortran 77 language and certain extensions. It costs $295. Language Systems, 463 Carlisle Drive, Herndon, Va. 22070. 703-478-0181.

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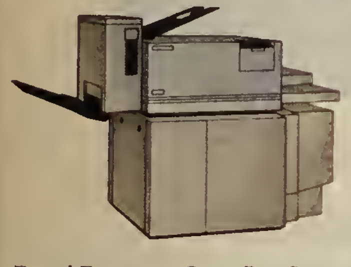
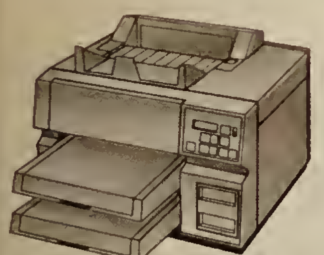
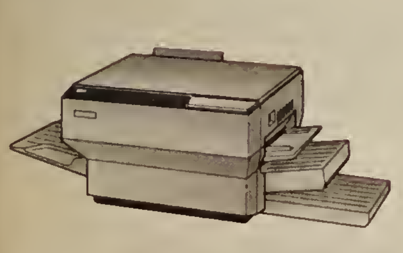


Digital Equipment Corp. PrintServer 40™



Texas Instruments OmniLaser™ 2115



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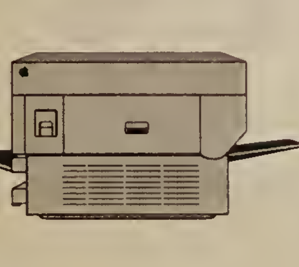

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NETWORKING

DATA STREAM

Patricia Keefe

EDI to gain users in '88

Electronic data interchange (EDI) is expected to move beyond today's large implementations in leading corporations and select industries to garner the attention of the masses in 1988.

This year will see EDI studies launched en masse and pilots expanded — or so we are told. Spurring that pilgrimage will be continued progress toward incorporating the CCITT X.400 and X.12 standards into EDI in general and in efforts to minimize the differences between each industry's EDI implementation.

At next week's Communication Networks '88 trade show, EDI novices and advocates alike can catch a glimpse into what could be a roller coaster year for EDI by attending a session called "EDI: What the communications manager needs to know."

The session will report on the status and implications of EDI and interenterprise electronic mail, according to session chairman Walter Ulrich, a partner with Coopers & Lybrand.

Possibly the most exciting — or most frightening, depending on your position — impact of EDI is the fact that it is changing the way companies do business.

Paper-free

On a basic level, EDI represents the paperless invoice. Mountains of paperwork and accompanying armies of clerks can be cut down to manageable size, if not totally eliminated, simply by switching to electronic forms. Orders, billing and payment receipts can all be automated and sent faster electronically than is possible when sending hard copy by standard postal service.

Compiling this information into an electronic data base, whether a private or a public industry data base, also provides reams of information on market demographics, buying trends and so forth at the stroke of a key.

The competitive advantages

Continued on page 51

High-speed modems on upswing

Dial-up products seen flourishing until ISDN gets under way, report says

BY ELISABETH HORWITT
CW STAFF

In the next few years, dial-up modem market segments from 4.8K bit/sec. on up should account for the majority of the modem industry's growth, according to a recent report from International Data Corp. (IDC).

The overall market will rise at a compound annual growth rate of 5% for units shipped, according to the Framingham, Mass., research firm.

The widening acceptance of the V series of international standards — including V.22, V.29 and V.32 — has promoted intervendor interoperability but has also made network management a top priority, particularly for high-speed modem networks.

Modems used in extensive leased-line and modem-pooled dial-up applications must have enough intelligence to support network management and control systems, IDC said. But most network management systems are still proprietary, making multivendor network management difficult.

Businesses choosing between dial-up and leased-line modems will have to weigh the lower cost of dial-up modems against the more sophisticated network management features of leased-line modems, the report said.

Dial-ups catch fire

A major recent trend has been the rapid growth of proprietary dial-up modems supporting speeds from 14.4K to 19.2K bit/sec., as opposed to the 9.6K bit/sec. dial-up modems that support the V.32 standard.

Low availability of V.32 products, coupled with their initially high prices, may have accounted for their low growth in 1986, IDC said. Last year, however, V.32 modems became more widely available, and prices have come down from $3,500 to about $2,400. This should result in a market shift to higher speed dial-up modems, according to IDC.

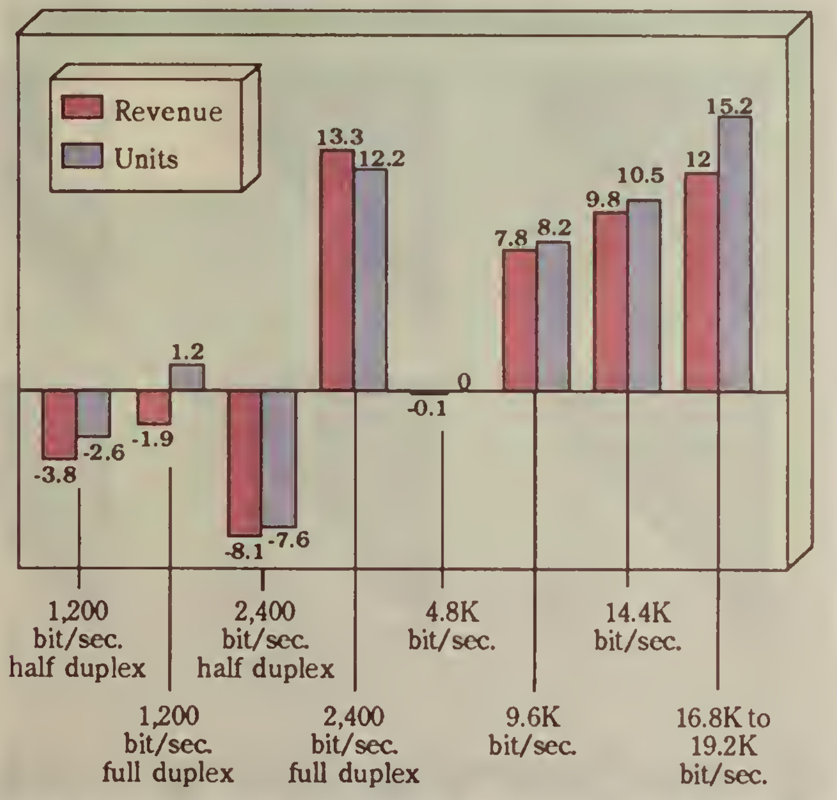
Leased-line modem sales are being threatened by the decreasing prices and growing availability of digital alternatives such as T1 lines and services, which provide comparable reliability and network management features, the report noted.

On the other hand, the main attraction of dial-up modems is

Continued on page 50

Five-year modem market forecast

Compound annual percent growth by transmission speed, 1987 to 1991



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART

Mac-IBM file swaps supported

BY PATRICIA KEEFE
CW STAFF

OTTAWA — The first asynchronous communications package said to support file exchange between the Apple Computer, Inc. Macintosh and IBM mainframe applications has been introduced by Simware, Inc.

The Mac3270's asynchronous capability eliminates the expense of terminal emulation boards, cluster controllers and coaxial cabling that a synchronous environment requires, according to Peter Hirshberg, manager of large systems connectivity at Cupertino, Calif.-based Apple.

The software is said to support mainframe applications running under IBM's MVS/VTAM, GCS/VTAM and VM systems and requires no additional hardware beyond a Hayes Microcomputer Products, Inc.-compatible modem.

"We expect Mac3270 will help accelerate Apple's penetration of IBM mainframe sites,"

Continued on page 51

Inside

- GE enhances PC Mailbox application for PCs. Page 54.
- Thomas-Conrad tool provides fault tolerance for Arcnet LANs. Page 54.

X.25 in show limelight

Packet-switch boom to continue at Comnet '88

BY ELISABETH HORWITT
CW STAFF

WASHINGTON, D.C. — Last year's spate of CCITT X.25 packet-switching product announcements is expected to continue at the Communication Networks Conference '88, known as Comnet, which will be held here next week.

Both vendors and users have become increasingly enamored with packet switching, analysts report, for a variety of reasons, including increased IBM support, better intervendor connectivity and the X.25 standard's incorporation into emerging networking standards such as Integrated Services Digital Network and the ISO's Open Systems Interconnect.

Another development that reportedly boosts packet switches' price/performance is the incorporation of off-the-shelf microprocessors. Comnet announcements of this type are slated to include the following:

- Netrix Corp. in Herndon, Va., will introduce the Netrix #1-Integrated Switching System (NSS), which is said to incorporate packet switching, circuit switching and multiplexing in one unit. The system combines X.25 and circuit-switched channels over the same 56K bit/sec. line, with a T1 interface to come later this year, the vendor said. The circuit-switched capability allows the unit to support proto-

Continued on page 50

Micom bolsters TCP/IP line with workstations, software

BOXBORO, Mass. — Micom-Interlan, Inc. has introduced five Transmission Control Protocol/Internet Protocol (TCP/IP)-compatible products.

New Micom-Interlan products based on the de facto networking standard include the following:

- A Novell, Inc. Netware-compatible turnkey TCP/IP workstation priced at $795 and a software-only distribution kit that costs $400.
- The NP722, a protocol processor embedded with TCP/IP software for AT&T Unix System V, Release 3 VMEbus-compatible systems, that costs $2,390. It is the first commercially available board to integrate both Unix System V, Release 3 and a University of California at Berkeley Unix 4.2 interface, the vendor claimed.
- The NP322, a turnkey multibus network protocol processor for the Unix System V, Release 3 environment priced at $2,190. It is said to be the first commercially available board to integrate both a Unix System V, Release 3 and a Berkeley Unix 4.2 socket interface library.
- PC/TCP Version 2.0, the latest upgrade to Micom-Interlan's networking software, which provides IBM Netbios compatibility. Available next month, it is set to cost $480.
- Terminal Server Software

Continued on page 50

CINCOM Is The B

Mr. Donald Brout
Staff Vice President of Information Technology
Nabisco Brands, Inc.

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That need for full relational technology narrowed Nabisco's choice to SUPRA™ from Cincom®. After weighing how SUPRA and its competitors adhered to Dr. E. F. Codd's relational model, Nabisco "concluded that SUPRA is significantly

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ahead of its competitors in terms of relational capabilities, particularly with regard to referential integrity,'' Brout explained.

SUPRA's advanced relational structure provides Nabisco with the ability to change its business rules dynamically without having to change the applications that accept orders, prepare bills of lading and perform other vital day-to-day business functions. "This will put us in the position of being able to support an ever-changing and ever-improving business environment,'' noted Brout, whose company also uses MANTIS®, ULTRA Relational DBMS™ and Cincom's Manufacturing System. "We will be in a position to become a supplier of choice for our customers because of our ability to deal with them in an individualized way.''

Furthermore, with Cincom products as a corporate standard, Nabisco will reap the rewards of a complete, open software architecture with the ability to operate in both IBM® mainframe and DEC™ VAX™ environments, as well as benefit from Cincom's extensive worldwide service and support.

"The choice of SUPRA and Cincom products was definitely a strategic decision,'' Brout concluded.

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X.25

FROM PAGE 47

cols such as IBM's Systems Network Architecture (SNA) that do not run efficiently over an X.25 network, according to Netrix Vice-President of Marketing Thomas Jones.

Starting at $15,000, the #1-ISS can be configured with up to 16 Motorola, Inc. 68010-based modules, each of which can support up to 63 ports running at 56K bit/sec., according to Jones.

A separate, mouse-driven, graphics-based network management system based on an Apollo Computer, Inc. workstation is priced at $40,000. Both products are set to be be available in the second quarter of this year.

- Plantronics Futurecoms, Inc. in Frederick, Md., will release the PAC.25 Turbo, which is based on the Motorola 68000. The device combines a packet switch, a packet assembler/disassembler (PAD) and a protocol converter in the same unit.

Ports can be configured to provide asynchronous PAD connections or X.25 links and can also support SNA, Telex and X.75 protocols.

PAC.25 Turbo can handle up to 300 packet/sec. and 64K bit/sec. throughput. The device offers network management capabilities. An eight-port unit is priced at $5,225 and is expandable to 42 ports.

- Dynatech Data Communications Group in Woodbridge, Va., will introduce the CPX.25 Model 20 Switch, its new generation of packet switches based on the 68000. The switch can be configured to support up to 20 trunks, each handling 64K bit/sec. throughput. It is said to transmit more than 500 packet/sec. Shipping now, the device is priced at approximately $800 per interface. Dynatech will also show its Model 8 PAD, an eight-port, 68000-based PAD priced at $2,850.

Micom

FROM PAGE 47

Version 1.3 for the NTS100 TCP/IP Ethernet Terminal Server, which reportedly provides expanded TCP/IP functionality and greater performance. It is available in standard and turbo packages that cost $150 and $250, respectively. The turbo version is targeted at high-performance applications such as computer-aided design and graphics.

Micom-Interlan also announced the LAN Detector, a protocol analyzer for troubleshooting and evaluating the performance of local-area network data networks.

Takes all comers

The LAN Detector operates on any Ethernet or 802.3-based LAN. It accommodates a wide range of protocols, including Netware, TCP/IP, Xerox Corp.'s Network Systems, Microsoft Corp.'s MS-Net, Sun Microsystems, Inc.'s Network File System and Digital Equipment Corp.'s Decnet. A set of options enable users to configure the LAN Detector to identify specific problems.

The analyzer can be installed on any IBM Personal Computer AT-class machine and uses Micom-Interlan's NP600 Ethernet or NP600 Starlan Protocol Processor as the network interface.

Free demonstration diskettes are available through Micom-Interlan's distribution channels. Pricing for the LAN Detector starts at $11,000.

Modems

FROM PAGE 47

their low cost and ability to serve almost any location in the U.S. Digital network offerings will not begin to compete in terms of geographic availability until Integrated Services Digital Network wins broad industry acceptance, IDC said.

The market for 14.4K bit/sec. multidrop modems could gain a significant boost in the 1988 to 1991 time frame if IBM launches a major marketing thrust in this area, IDC said. Multidrop modems allow multiple devices at different locations to share a single leased analog circuit.

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For instance, IBM's Expert Systems Environment software helps Fireman's Fund put the knowledge of its most senior people into a computer. This means that others with less experience can access the judgment of an expert underwriter when analyzing a risk.

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Keefe

FROM PAGE 47

are tremendous: cost and labor reductions, faster turnaround, immediate access to more accurate data and the elimination of geographic barriers to certain kinds of business. There's also something to be said for using the same forms and the same system to handle multiple supplier relationships.

Of course, there are kinks yet to be worked out. Although not cheap to implement on a wide-scale basis, PC-based EDI systems have removed the cost barrier on the low end.

A key area of concern easily overlooked by many EDI users is the level of auditability and control available with EDI transactions. In the traditional paper-oriented office, hard copy is readily available to double-check for proper business and financial controls. EDI more or less replaces those documents with electronic signals.

Some smaller companies have been forced by large accounts to use a particular EDI system or form despite a preference for another. Users who deal with more than one industry may find themselves saddled with two EDI systems standardized to meet the needs of a particular business. Ulrich concedes that there is not always as much coordination as there could be between the different industries championing EDI.

Interoperability is an issue, but it is being addressed in part with X.400, which functions much like E-mail versions of the Transmission Control Protocol/Internet Protocol suite.

The EDI Council of Canada has designated X.400 the enveloping mechanism for EDI transactions. The U.S. is expected to follow suit.

Would-be users and trading partners can also expect a change in tactics this year from EDI advocates — a swapping of the iron fist for the velvet glove. Whereas 1986 and 1987 saw powerful purchasers demanding that their partners install EDI systems, 1988 will combine grass roots interest with encouragement for voluntary participations.

And instead of threatening the small supplier, EDI users will begin touting the benefits — for both the companies. Banking is an example of an industry hopping on the EDI bandwagon with much encouragement from its customer base.

Keefe is a *Computerworld* senior editor, networking.

File swaps

FROM PAGE 47

Hirshberg said.

Macintoshes made up 4% of the installed base of micros at 9,687 IBM mainframe sites recently surveyed by Computer Intelligence. The number of Macintoshes at those sites is expected to more than double this year, the La Jolla, Calif., market research firm said.

Mac3270 is said to include a Mac-style interface and to allow users to cut and paste data back and forth between IBM 3270 and Mac applications. Apple, which helped Simware implement the Mac-like features, has trained its direct sales force on the product.

Like SimPC, the vendor's PC-to-mainframe software, Mac3270 reportedly provides a script language, full-screen 3270 emulation and file exchange with corporate IBM TSO and CMS applications via dial-up lines, including CCITT X.25 networks. In addition, it runs in conjunction with Simware's host-based protocol conversion software, Sim3278, and offers Digital Equipment Corp. VT100 and IBM TTY terminal emulation.

Since the script language is the same for the Mac and the IBM Personal Computer, users can create scripts portable from one environment to the other.

Mac3270 runs on the Macintosh 512KE, the Mac Plus, the MacSE and the Mac II and supports the most recent versions of the Mac's Finder and Multifinder software. Set to be available next month, Mac3270 will cost $250. Multiple-copy licenses are available.

Early users include Motorola, Inc. and Chevron Corp.

In addition, an office system, running on an IBM 3090 with MVS/XA, was designed using IBM's Distributed Office System (DISOSS) and IBM's Professional Office System (PROFS). It links Fireman's Fund headquarters in California to its branch offices around the country, allowing them instantaneously to send and receive electronic mail, and file it for future retrieval.

With the support of IBM, Fireman's Fund can respond faster and more accurately to its customers' needs. According to Fireman's Fund Systems Vice President, Deems Davis, "IBM is our insurance policy."

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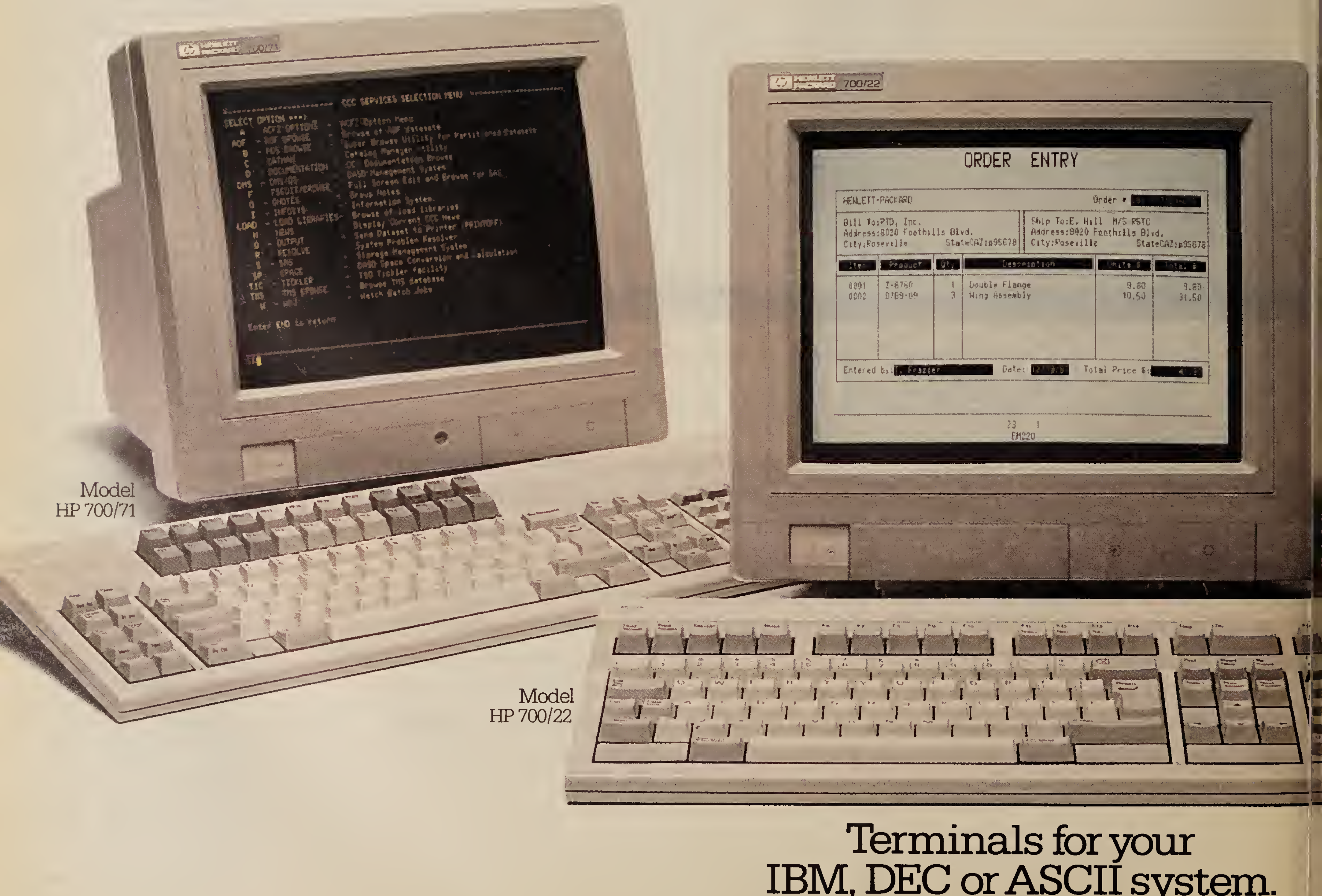

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NEW PRODUCTS

Local-area network hardware

Centrecom 800-BT and **1600-BT**, transceivers for single-tap connection of up to 256 computers and peripherals to Ethernet local-area networks, have been announced by **Allied Telesis, Inc.**

Centrecom 1600-BT is a 19-in. rack-mounted product that allows direct connection of eight to 16 devices.

Centrecom 800-BT is an eight-port tabletop version of the same product with read cable connections. Both conform to Ethernet Version 2 and IEEE 802.3 standards.

Centrecom 1600-BT costs $995 for an eight-port configuration and $1,495 for a 16-port unit. Centrecom 800-BT costs $795.

Allied Telesis, Suite 1220, 2685 Marine Way, Mountain View, Calif. 94043. 415-964-2771.

Customer-premise equipment

Advanced Computer Communications has introduced a device said to act concurrently as a packet switch and a concentrator that feeds multiple packet-switched lines into one.

As a local packet switch, the **ACS 8250** links up to eight computer hosts or workstations attached to packet assembler/disassemblers that support the CCITT X.25 protocol.

As a concentrator, it supports up to six packet-switched links and sends them over a single 64K bit/sec. line to an X.25 packet-switched network. Features include a menu-driven, user-configurable routing table and a password-protected net management facility.

The ACS 8250 costs $6,500.

Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101. 805-963-9431.

Links

VM Messenger, a communications software package designed for use in the IBM VM/CMS environment, has been announced by **Systems & Telecoms, Inc.**

VM Messenger is said to enable IBM mainframes to handle interchanges between discrete communications services, including electronic mail, international telex and packet switching. It supports E-mail services.

VM Messenger costs about $26,000.

Systems & Telecoms, Suite 100, 12020 Sunrise Valley Drive, Reston, Va. 22091. 703-391-2712.

Electronic mail

GE Information Services has enhanced its **PC Mailbox** software application that allows an IBM Personal Computer to function as an international message center.

Based on GE's global electronic mailbox service, Quik-Comm, PC Mailbox Version 4.0 features expanded addressing functions that permit addresses to be sent or received from another user's system, the option to print all messages received, the ability to modify a line length, an administrator's program for customizing installations and a program for reporting the status of transferred information.

PC Mailbox Version 4.0 costs $249.

GE Information Services, 401 N. Washington St., Rockville, Md. 20850. 800-433-3683.

Security

A software package designed to provide fault tolerance for Arcnet local-area networks has been announced by **Thomas-Conrad Corp.**

The **TC6099 Safety-Net** software allows two physical Arcnet LANs to operate in parallel. If one network goes down, the other continues to operate.

TC6099 Safety-Net costs $39.95.

Thomas-Conrad, Suite 1C, 8403 Cross Park Drive, Austin, Texas 78754. 512-836-1935.

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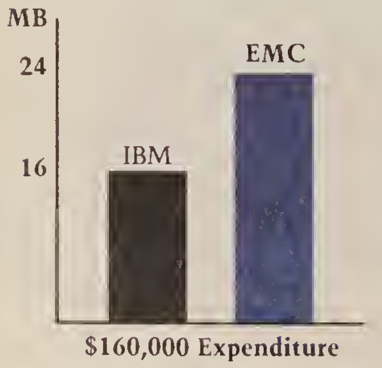

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KEYNOTE: The Connectivity Crisis: A Global Roadmap For Progress

The role of communications is to facilitate and enhance the conduct of business and to positively impact the bottom line. This year's distinguished keynoter, a veteran executive and visionary will address the issues of global communications in a worldwide economy, the increased reliance on data as a corporate asset, and the building blocks for computer-enhanced commerce in the twenty-first century.

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RM-5	The Payoff in Project Management Systems
RM-6	Improving Capacity Analysis and Management: Timing the Most Efficient Upgrade
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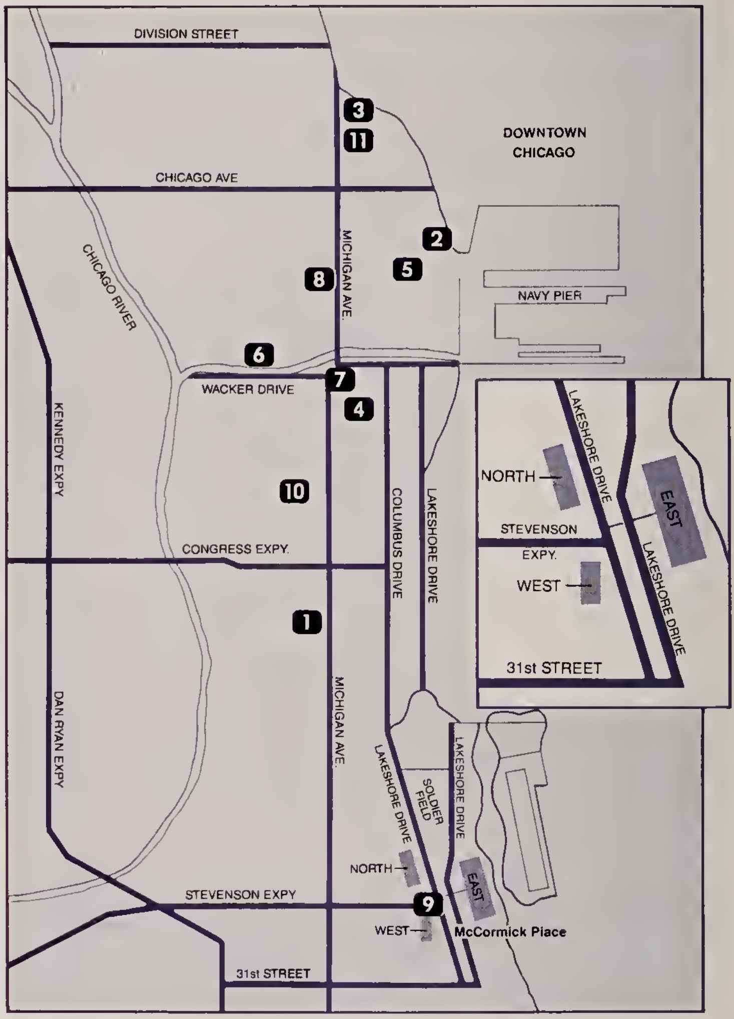

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SYSTEMS & PERIPHERALS

HARD TALK

James Connolly

Dynamic dual deb of 1988

Prime Computer's proposed takeover of Computervision dominated talk in the computer industry as the ew year began, but Prime also ook the initiative on a second ront that will be hot this year.

Prime got the jump on its ompetition by touting its multirocessing capabilities in a echnical briefing held early this onth in conjunction with the nnouncement of the first shipents of Prime's high-end, ual-processor 6550 superminiomputer.

Prime opened the year by sing what is likely to be a buzzord in 1988: symmetric multirocessing. It is a term applied to ystems in which two CPUs act s peers that are equally capable f handling I/O tasks and intruction processing. The techology will be heavily promoted y minicomputer companies this ear and could be at the heart of igh-end superminicomputer nd small mainframe competiions involving Prime, DEC, ang and IBM.

About the time that Prime as shipping its first three 550s, Wang was announcing ts VS 7320 dual processor and

Continued on page 57

GE offers remote computing

Distributed service simulates IBM 9370, provides software alternatives

BY STANLEY GIBSON
CW STAFF

ROCKVILLE, Md. — Responding to demands for distributed processing, GE Information Services, a division of General Electric Co., recently offered a remote service that simulates an IBM 9370 departmental computer while using IBM's MVS/XA.

The Mark 9000 service, which is run on a GE IBM 3090 mainframe, offers software such as MVS/XA, IBM's DB2, DL/1 and CICS and other large mainframe packages not currently offered by IBM on 9370s, the vendor claimed.

"If a client's business requirements include multiple, distributed 9370s, remote access to one 9370, the integration of its 9370 systems with other mainframe systems or a CICS capability, then the Mark 9000 is an alternative," said Lance Pelter, GE product manager.

The Mark 9000 was created in answer to what industry observers see as a key use of the 9370: as a distributed processor that will be managed from a remote central site.

"In our experience, people with big MVS shops may not want to distribute their operations people. This would permit them to save the expense of sending trained MIS personnel to manage remote operations," Pelter said.

The Mark 9000 package includes the operating system, tools, utilities and some 50 software packages. GE is also offering system design, application support and work load profile management assistance. Users also gain access to GE's worldwide teleprocessing network.

A typical monthly cost for the Mark 9000 service under a three-year contract is $16,000, which is about 4% to 5% less

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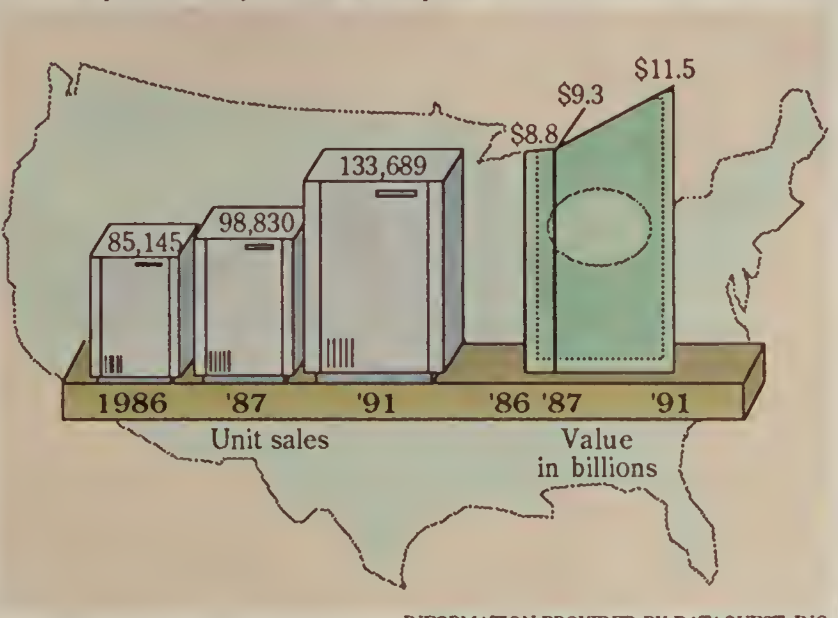
Data View

How many minis, and what will they cost?
A prediction of U.S. minicomputer sales and their values



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Encore seeks new markets

BY JAMES CONNOLLY
CW STAFF

MARLBORO, Mass. — Encore Computer Corp. has joined the list of Unix-based computer makers turning their attention from high-performance technical computing toward general-purpose commercial processing.

As Sequent Computer Systems, Inc., with its parallel processors, and Hewlett-Packard Co., with its HP 9000 series, have targeted the commercial market in recent months, Encore is taking steps into the general-purpose computing arena.

Continued on page 58

Topologix aims for the Sun

DENVER — Topologix, Inc. targeted users of Sun Microsystems, Inc. workstations last month with a plug-in parallel processing system called the Topology 1000.

According to a company spokesman, the system offers Sun users increased performance for such applications as image processing, computer-aided design and engineering and computer-integrated manufacturing.

The Topology 1000 consists of customized parallel computer programming software and a custom-designed attached processor board. According to the spokesman, the product's nonbus architecture, in which all elements are linked, permits the construction of computer networks of arbitrary size and topology.

Each attached processor board features four 32-bit microprocessors. According to the

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Inside

- Esprit breaks away from CRT terminals pack with displays for different market segments. Page 58.
- NCR terminal combines night depository, ATM in same unit. Page 60.
- Canon rolls out flatbed image scanner. Page 60.

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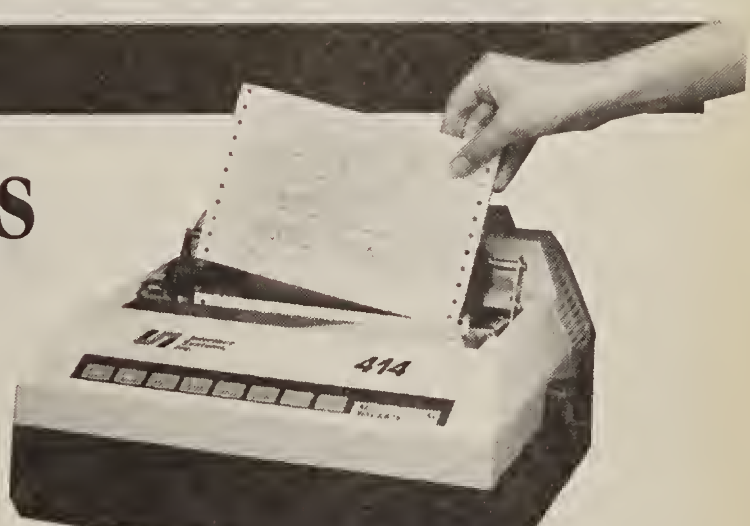

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Topologix

CONTINUED FROM PAGE 55

spokesman, the use of a memory array for each processor provides a peak performance of 80 million reduced instruction set computing instructions per second for each board. Up to eight of the boards can be plugged into one Sun workstation, yielding a peak performance of 640 million instructions per second, according to the spokesman.

Each processor has from 1M to 16M bytes of associated memory. A maximum of 64M bytes of dynamic random-access memory may be utilized per board.

Topologix's Parallel Common LISP and Parallel C software languages are used to perform parallel processing. Both symbolic and numeric parallel processing applications are supported, the vendor said.

VMEbus interface included

Also included in the Topology 1000 are a Motorola, Inc. VMEbus hardware interface, error detecting memory, link buffering and full crossbar switching.

Initial pricing for the Topology 1000 ranges from $24,900 for a basic system, including one attached processor board with 4M bytes of memory running Parallel C, to $34,900 for a system running Parallel Common LISP and Parallel C with 32M bytes of real memory.

Delivery is slated for May, Topologix said.

GE

CONTINUED FROM PAGE 55

than owning a 9370, including software, support and personnel expenses, according to Pelter.

He added that the service is already being used by several customers, including National Westminster Bank PLC in London.

The Mark 9000 service is offered in five different models with varying memory, storage and contract length. All configurations include software, maintenance, systems programming, operations and system support services and a 9.6K bit/sec. leased line.

Although the 9.6K bit/sec. speed is standard for the system, it can also operate at a rate of 56K bit/sec., according to GE.

A user could have a variety of configurations on-site, ranging from a cluster or clusters of 3270 terminals and controllers to IBM Personal Computers or compatibles or a high-speed printer using Digital Communications Associates, Inc. Irma boards.

Appeals to expanding shops

Pelter said he expects to sell the service to both large and small MIS shops. He said user firms of any size that have the desire to rapidly expand to a large number of locations would be potential Mark 9000 customers.

Another likely class of users, according to Pelter, would be those working on short-term projects under tight budget constraints, such as some government contractors, who would not want to make an investment in hardware.

Security is provided by IBM's RACF, a security tool used by GE in its other timesharing services.

Connolly

CONTINUED FROM PAGE 55

identifying the first user.

Meanwhile, DEC reportedly is preparing for the announcement of its first symmetric multiprocessor, and IBM is said to be readying enhanced versions of the IBM 3090 family, against which DEC and Prime position their high-end systems.

Most industry observers acknowledge that IBM already offers symmetric multiprocessing with the 3090s, although the minicomputer vendors' multiprocessor systems will likely end up competing with low-end uniprocessor 3090s.

What users should be ready for is a flood of claims and counterclaims as each vendor explains why its particular approach to multiprocessing is best. It is unfortunate that there will be no easy answers for those users, even in dealing with major vendors such as Prime, DEC, IBM and Wang.

Get the facts straight

The users' dilemma will be further complicated by the score or more of smaller vendors that are certain to adopt symmetric multiprocessing as their own, even if they merely use the term and don't offer the capability.

Therefore, the onus is on the users to make vendors explain their architectures and their use of the term symmetric multiprocessing, or peer processing, or whatever else they may use as a substitute for the process.

Some of those vendors are likely to make outrageous performance claims, perhaps as far out as saying they have a general-purpose computer based on 1,000 symmetrical CPUs.

It is up to the user to make the vendor explain details, such as how each processor accesses memory and how tasks are assigned to those processors. Only then can the buyer know if the proposed system might achieve the claimed performance — and can do it in the user's individual environment.

Connolly is *Computerworld's* senior editor, systems & peripherals.

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Encore

CONTINUED FROM PAGE 55

Encore Chairman Kenneth G. Fisher said the company will continue to sell its Multimax systems to the technical computing and educational communities while riding what he feels will be a wave of success for Unix and Pick Systems' Pick in the commercial world.

He also boasted that Encore can force a generational change in computing — which may force established vendors such as IBM and Digital Equipment Corp. to restructure their price/performance levels and shift to Unix — through what he called Encore's unprecedented price/performance levels and its adherence to standards.

Fisher said Encore plans to use price/performance as "kind of an opener for sales situations" in the commercial market and then emphasize what he called Encore's strengths: connectivity, user interfaces, Unix-based solutions and support.

Encore reported an installed base of 101 Multimax systems as of Dec. 1, 1987. Fisher said commercial-type information processing, including government work, represented 10% to 15% of Encore's business in 1987, but he predicted that commercial processing will make up 50% of that business by the end of this year.

Fisher said Encore wants to provide medium-size companies with host systems or provide large companies with systems to support new applications. He admitted that Encore is unlikely to displace IBM mainframes in large companies.

According to Fisher, Encore holds advantages over other multiprocessor system vendors because of its focus on the Transmission Control Protocol/Internet Protocol (TCP/IP) and the Encore Annex terminal concentrator, both of which provide flexibility and compatibility with various vendors' systems. He said those competing vendors use Unix as their interface with other environments, while Encore relies on TCP/IP.

He claimed Encore has proven connectivity products for diverse environments, such as Ethernet, DEC's Decnet and IBM's Systems Network Architecture. He said Encore's varied user interface offerings allow Multimax systems to coexist in environments in which users already run systems such as IBM mainframes and Personal Computers, DEC VAXs and other Unix-based systems.

Going according to plan

Fisher said Encore's bid for the commercial market has been part of the corporate plan since Encore was founded in 1983. He said the current drive is being fueled by the increasing availability of Unix and Pick software and Encore's having established its credibility in the research and education markets.

The number of recognized Unix packages increased tenfold from 400 in 1985 to 4,000 in 1986, Fisher claimed. Encore has campaigned to port major data base management offerings, including Oracle Corp.'s Oracle, to the Multimax.

Fisher also said Encore is focusing its Pick offerings on commercial accounts. In September 1987, Encore allied with VMark Software, Inc. to offer VMark's Pick-based Uni-Verse relational data base management system and applications on the Multimax. According to Fisher, the alliance helps Encore target Pick sites with more than 100 users.

Kenneth G. Fisher

"We bring two things to the party: connectivity and unprecedented power," Fisher said, claiming that most Pick systems have lacked the power to adequately support more than 100 users and have lacked the communications abilities to tie into IBM and other vendors' systems. He claimed Encore's second-generation system, the Multimax 320, can process up to 40 million instructions per second and that a third-generation system based on the National Semiconductor Corp. 32532 chip will provide three times that power.

According to Fisher, Encore's initial success in the general-purpose computing market has been with organizations such as universities — in which Encore has made progress selling systems for research and in which the schools are now using Multimax systems for administration — and in government agencies such as the Internal Revenue Service. But he said Encore now expects to move into companies such as medium-size banks.

The economic effect

"The ideal customer has lots of users, lots of data base requirements and lots of data base activity," Fisher said. "I don't think economics will totally rule the roost. I think people will want to try it before they commit their whole company to it, particularly with a small company like us."

Fisher's comments were met with skepticism by at least one analyst. "I wonder about the strategy, because Unix isn't that strong in the commercial marketplace," said analyst Vickie Brown of Framingham, Mass., market research firm International Data Corp. She noted that Encore may be looking at the commercial market now because it has not penetrated the technical market as deeply as it might have liked.

"I get the sense that they are not really in the technical market. It's just one of those companies that doesn't get the fame. It may be strong to say that they are in no-man's-land, but I'm afraid that may be true," Brown said.

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Esprit breaks away from CRT pack

BY ALAN ALPER
CW STAFF

MELVILLE, N.Y. — Seeking to distinguish itself from the CRT terminals pack, Esprit Systems, Inc. recently unveiled three displays aimed at evolving portions of the marketplace.

One terminal, called Lan Term, is a display targeted at users who need one workstation to run IBM Personal Computer-compatible, Microsoft Corp. Xenix or Pick Systems Pick applications and to share resources and files on a local-area network. Lan Term includes an Intel Corp. 8086-compatible microprocessor for local processing, an IBM Enhanced Graphic Adapter-quality display and an interface for integration into Novell, Inc. Netware LANs.

Carrying a list price of $1,095, the 14-in. terminal comes in a package two-thirds the size of an IBM PC XT. It is offered with 768K bytes of dynamic random-access memory to accommodate most micro applications, Hercules Computer Technology, Inc. graphics compatibility, an RS-232 port for direct connection to a host computer and a parallel printer port. Included is a Novell Netware LT installation diskette.

The product is expected to compete with diskless workstations offered by microcomputer and LAN vendors, noted Sal Lanuto, Esprit's vice-president of marketing. Co-developed with ICM, Inc. in Southgate, Calif., Lan Term's advantage over competing products is that it was designed with display clarity, space restrictions and data security in mind, Lanuto claimed.

"What we're saying is that you don't have to abandon the advantages of a terminal to have an intelligent device on a network," Lanuto explained.

Esprit also introduced a color terminal featuring a screen format of 96 lines by 30 col. and offering windowing, graphics and simultaneous display of 16 foreground and background colors from a 64-color palette. The Picterm CBG terminal is expected to retail for about $1,500.

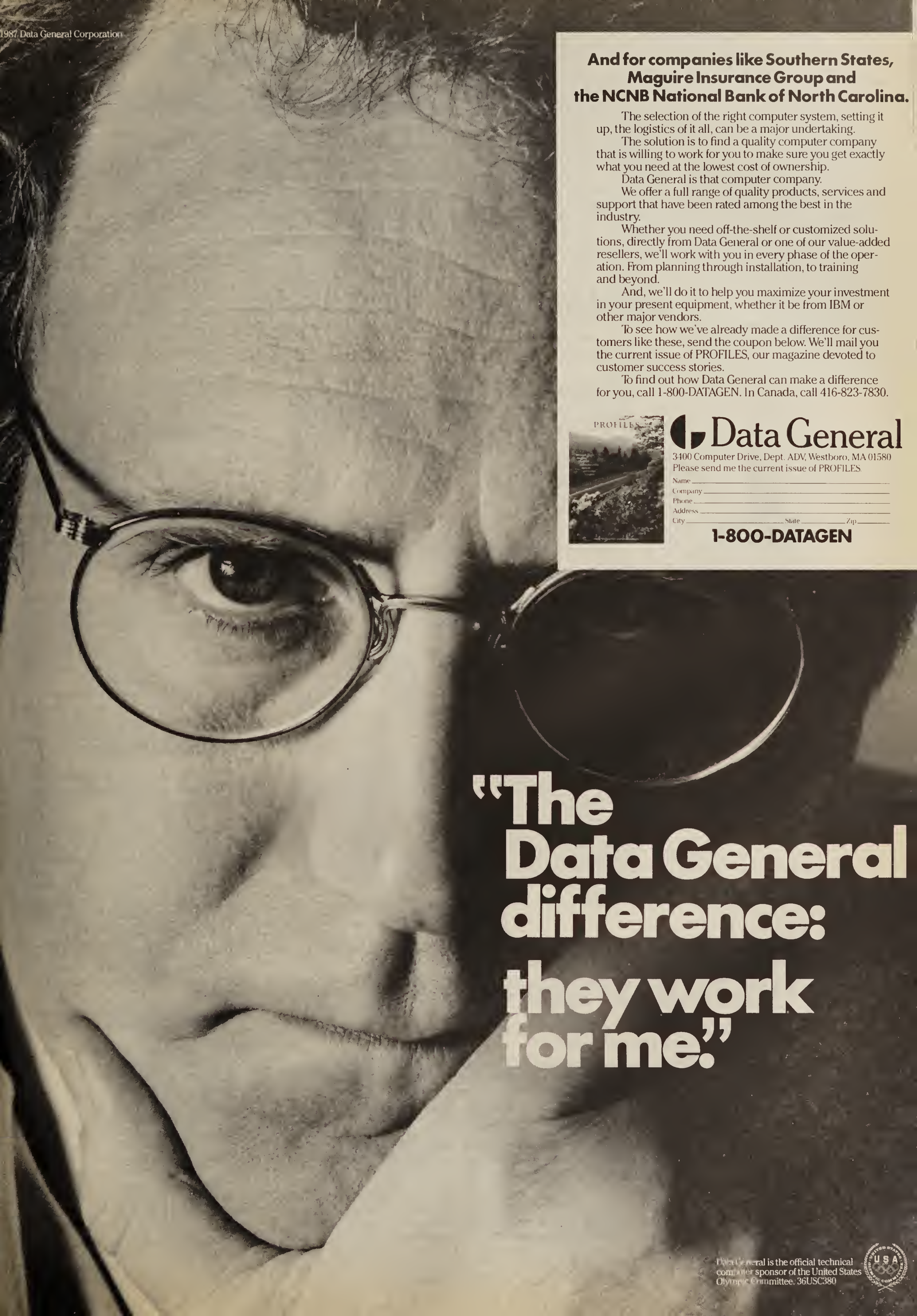
Picterm CBG features a window management facility to handle the display of multiple windows containing text or graphics. The terminal offers character-generated graphics that resemble bit-mapped graphics. Picterm accomplishes this by treating each 2- by 3-in. cell as a computer would address a pixel, noted Ernest Wassermann, Esprit's director of product marketing.

Health care segment targeted

Jointly developed with Meditech, Inc., a medical market software supplier in Watertown, Mass., Picterm CBG is expected to appeal to users in the health care, point-of-sale and financial industries, in which color has been widely accepted as a means of differentiating data, according to Esprit.

Esprit also added a terminal to its Opus family that offers local processing capability and the ability to access or run concurrent applications on two separate hosts. The terminal supports ANSI, ASCII or personal computer protocols and offers a hot key so users can toggle between sessions.

Called 3 In 1, the 14-in. flat-face terminal can display formats of 26 lines by either 80 or 132 col. and comes with a tilt-and-swivel base. It lists for $599.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NEW PRODUCTS

Processors

An array processor designed for Sun Microsystems, Inc. workstations has been announced by **Mercury Computer Systems, Inc.**

The **Zip 3232-VS** is a single-board 32-bit floating-point array processor system for use in scientific and engineering applications. According to the vendor, the board can process an entire task, consisting of I/O and mathematical algorithms, without host intervention.

The Zip 3232-VS includes two external ports that interface analog-to-digital and digital-to-analog converters at a peak rate of 20M bit/sec., 500K or 2M bytes of base memory and an arithmetic unit that performs 32-bit floating-point computations at a rate of up to 20 million floating-point operations per second.

Prices for the Zip 3232-VS start at $11,000.

Mercury Computer Systems, Wannalancit Technology Center, 600 Suffolk St., Lowell, Mass. 01854. 617-458-3100.

Graphics systems

A prepress workstation with a set of design and color manipulation tools has been introduced by **Coddbarrett Associates, Inc.**

The system, **Insight**, features a 48-bit processor; a 24-bit function coprocessor; 3.2M bytes of memory; a 240M-byte cartridge tape unit; up to three 300M-byte disk drives; 14 card slots; and a color display with 1,536- by 1,152-pixel resolution and 24 bits per pixel for full-spectrum color capabilities.

Input is handled via a standard digitizing tablet, and images can be scanned into the system or imported from prepress production systems. Capabilities include design, rendering and color correction.

The system is priced from $105,000.

Coddbarrett, 65 Ashburton St., Providence, R.I. 02905. 401-273-9898.

Data storage

A small computer systems interface (SCSI)/VMEbus host bus adapter has been introduced by **Xylogics, Inc.**

Called the **720**, the adapter is a single, standard VME board that controls up to seven SCSI targets with configurations set by the user software. According to the vendor, with optional daughterboards the 720 is capable of controlling 14 SCSI ports and two floppy disk drives.

The 720 host bus adapter combines with Xylogics' 8K-byte first-in, first-out architecture and its Dynathrottle direct memory access control to offer synchronous transfer rates of 4M bit/sec., asynchronous rates of 1.5M bit/sec. and direct memory access speeds of up to 18M bit/sec.

Prices start at $1,795.

Xylogics, 53 Third Ave., Burlington, Mass. 01803. 617-272-8140.

Terminals

A product said to combine a night depository and an automated teller machine (ATM) terminal in the same unit has been announced by **NCR Corp.**

The **NCR 5285** business depository was designed for placement in traditional financial institution branches or sites such as shopping malls. It can be accessed either through the NCR 5085 ATM or by key-lock control.

One feature of the 5285 is its ability to report to the terminal that an item has passed through the depository sensor field. When enough items have accumulated in the safe to block the sensor field, the items are automatically moved to the rear, increasing capacity.

A typical configuration costs $9,450.

NCR, 1700 S. Patterson Blvd., Dayton, Ohio 45479. 513-445-4169.

Printers/Plotters

A family of flatbed plotters in sizes ranging up from D has been announced by **Alpha Merics Corp.**

The plotters are said to be capable of drawing on a variety of material, including paper-thin drafting vellums up to 2 in. thick and wood planks as large as 48 by 96 in. They are compatible with Hewlett-Packard Co.'s HPGL graphics language and, according to the vendor, will run with most computer hardware and computer-aided design and graphics software.

The flatbed plotters are priced from $7,000 to $30,000.

Alpha Merics, 8031 Remmet Ave., Canoga Park, Calif. 91304. 818-999-5580.

Input devices

A flatbed image scanner has been introduced by **Canon USA, Inc.**

The **IX-12F** is said to input text, graphs, drawings, maps and pictures directly into a computer from books or continuously from sheets. It provides an image resolution of 300 dot/in. at a scanning speed of 16 sec./page. It also offers 32-level dithered halftones.

The IX/12F measures 14½ by 21½ by 3½ in. The image scanner is priced at $1,495. The optional 20-sheet document feeder costs $595.

Canon Systems Division, One Canon Plaza, Lake Success, N.Y. 11042. 516-488-6700.

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EXECUTIVE REPORT

MIS IN HEALTH CARE

Shaking off 15 years of DP-as-usual

BY JEAN S. BOZMAN

WARREN GEBERT

INSIDE

Diagnostic system goes on-line
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Health care CIO taking care of business
Page 68

Optical storage eases X-ray access
Page 71

Scene 1: You dream that you're standing in the Community Hospital of Indianapolis, where there were, until recently, 13 different computer systems. There is a single computer center now, and as MIS director, you are involved in the painstaking task of streamlining your system architecture. Eventually, your department will maintain only a handful of computers, including those from IBM, Tandem Computers, Inc. and Digital Equipment Corp.

A series of Tandem systems is already handling patient care systems, lending fault tolerance to this 24-hour-a-day, seven-day-a-week operation. Doctors and nurses can access patient information at any time of the day from terminals scattered throughout the hospital site. Nearby, IBM mainframes still handle the accounting work, while minicomputers dominate in the laboratories.

Scene 2: Hang in there, you're still dreaming. But this time, you're standing in one of the nation's largest for-profit hospital management corporations, Hospital Corporation of America (HCA). You can approach all systems, since they have the same user interface, written by HCA's programming staff of 400.

Unfortunately, you may not be able to send information to all 1,100 other HCA Towers in its 300-plus hospitals because most of the distributed computer systems in HCA's sprawling organization are used as stand-alone departmental processors. Each runs a copy of HCA's RM-COS proprietary operating system. Networking, however, is on the way. In 1988, HCA's information systems group plans to ship 300 copies of HCA's Hlink, a communications program that links 300 Towers systems.

Eventually, there will be one common network, allowing the easy transfer of data through the system and to Nashville headquarters, where IBM mainframes handle administration and decision support.

Scene 3: One final stop before this dream ends. You are now a doctor walking down the corridor of Beth Israel Hospital in Boston. Before seeing your next patient, you must review several lab test results. You approach one of 1,000 ASCII terminals in the hospital and log on using a personal security code.

The on-line data base system you are about to access for your patient's medical records is shared by Beth Israel and its neighboring medical center, Brigham and Women's Hospital. All departmental applications are running on Data General Corp.-based minicomputers.

You quickly scan the lab results, then turn right onto the next corridor to consult with your patient. The lab tests have confirmed your diagnosis.

If you are an MIS professional in the health care industry, be warned: Attempting to reenact this scene for your hospital staff may be hazardous to your health. Most large hospitals host a proliferating series of separate software and hardware systems to accomplish their daily task of patient care. But not for long.

Into the future

The giant known as the American hospital and health care industry, accounting for 11% of the U.S.'s gross national product, is finally shaking off 15 years of DP-as-usual. No longer will mainframes churn out patient bills and medical records far away from and unconnected with scattered minicomputers handling lab tests, radiology reports and pharmacy inventories. Instead, systems made by different manufacturers will communicate as well as capture and compile data flowing through the hospital, no matter what its source.

Why? Because as this tale of three cities points out, a veritable revolution has occurred in the management of hospital information systems, one that got under way in 1983, when the federal government first printed a price list for nearly 470 hospital procedures.

This shopping list, called DRGs, for Diagnostic Related Groups, turned the cost-plus world of hospital accounting on its head. Virtually overnight, hospital administrators began demanding new types of data for cost/benefit analyses.

For perhaps the first time since Medicare became a fact of life in the 1960s, hospitals had to analyze their cost structures — and justify their charges. The minicomputers that had proliferated as hospital departments bought them during the 1970s were simply going to have to be brought under control, one way or the other. Interfaces between centralized financial systems were going to have to be

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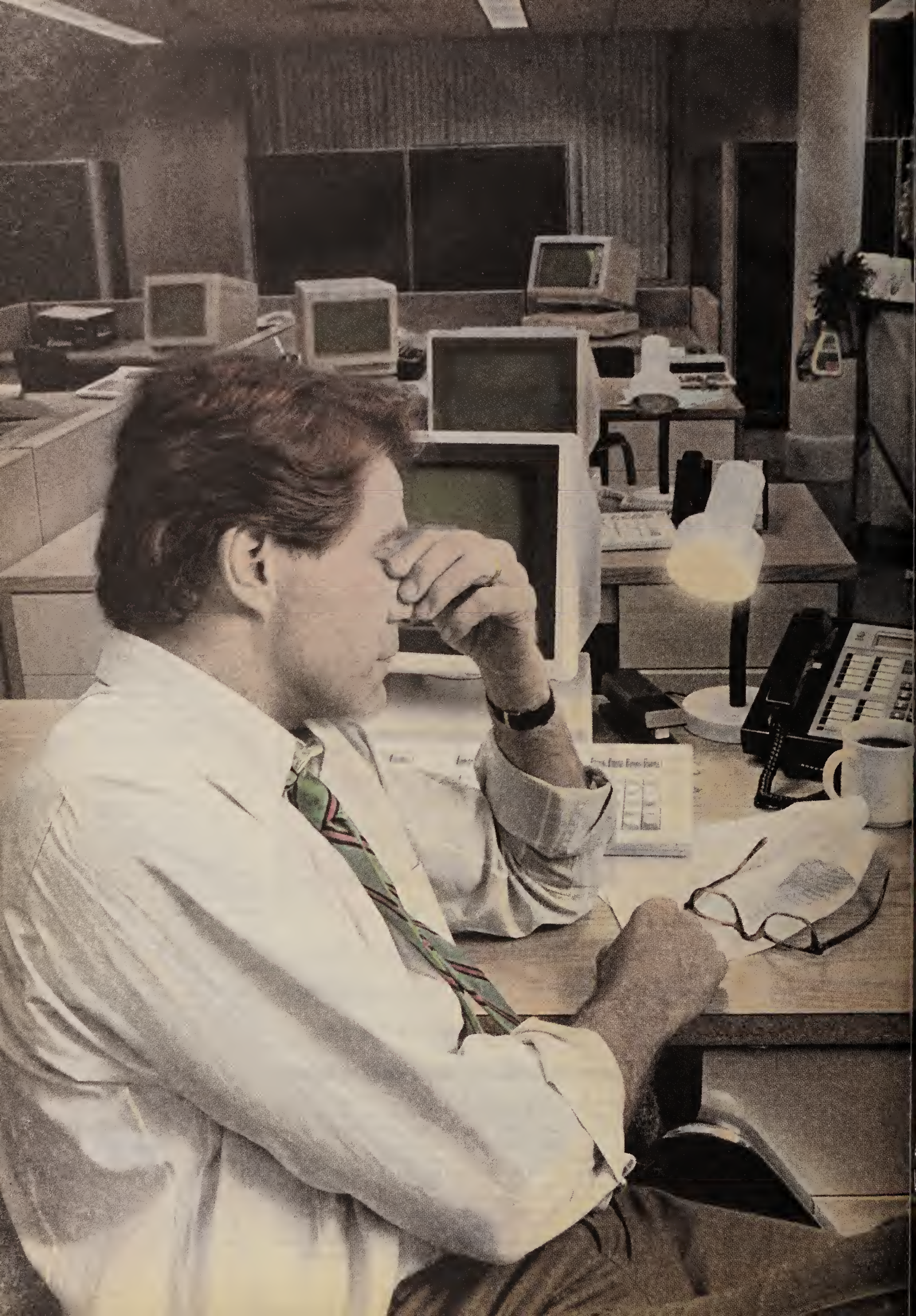
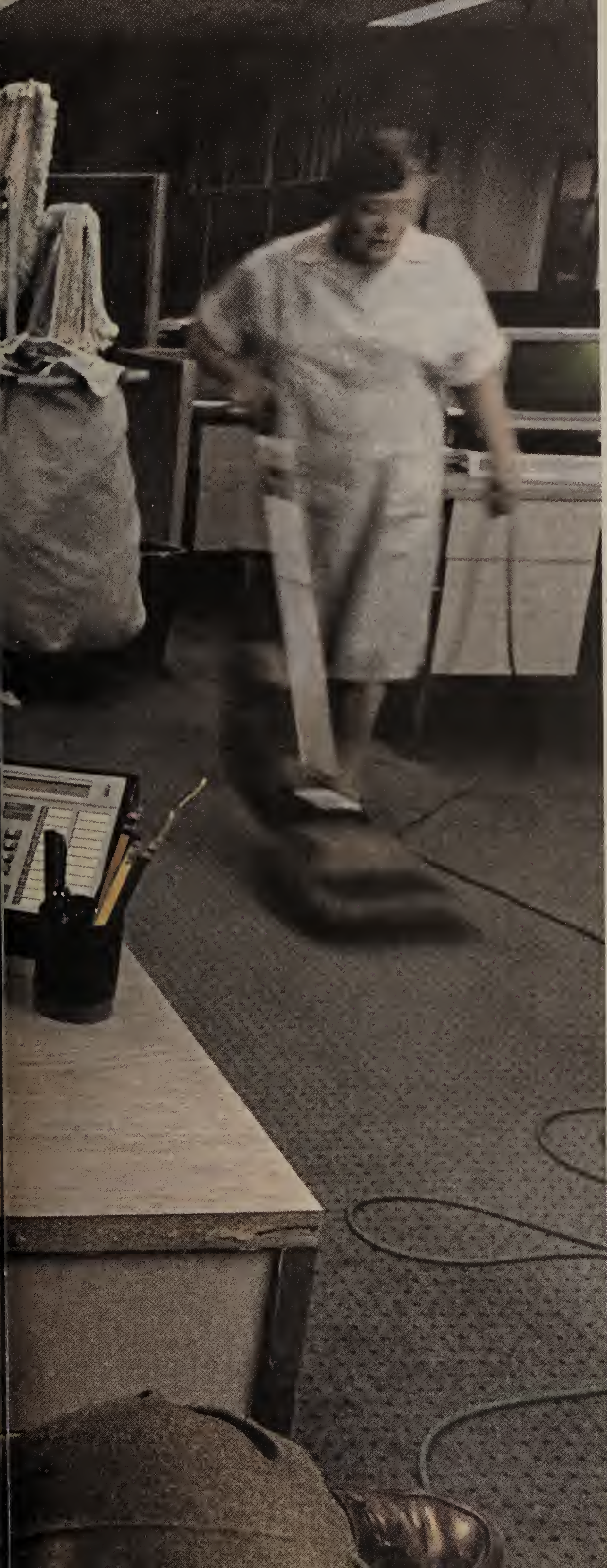
Bozman is *Computerworld*'s Midwest correspondent.





“It’s 6:33 pm. The lines are down. And she’s the closest thing I’ve got to a technician.

Meanwhile, I’ve got a sales guy here waiting to close a half-million-dollar deal, and he’s screaming ‘why didn’t my order go through.’ I have no clue. My technical staff is home watching the game. And all I keep thinking is whatever happened to that word reliability? If I could have anticipated the problem, at least I would have had a chance. As far as I’m concerned, somebody at headquarters better start talking to AT&T about getting a network management system. Or they can find themselves a new whipping boy.

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Shaking off

FROM PAGE 61

written so that mainframes could share the information generated within these systems.

"Hospitals finally realized that they need to summarize all the information generated in different departments into a form that is easily digestible by hospital administrators," says Lee Portwood, director of health care operations at Atlanta-based Management Science America, Inc., a provider of medical software applications. "That's forcing a lot of hospitals to throw many systems into the trash and start over."

Words that once conjured up images of manufacturing or financial institutions are now being applied to the evolving hospital scene as hospitals strive to compete for patient care dollars.

Some of the words creeping into the hospital MIS manager's lexicon are "transparent interfaces" and "integrated data bases." These will come into play more in the 1990s as a new world of health care emerges — one in which islands of automation will be tied together through communications and common data bases.

"THE KEY to automating hospitals is to look at where the transactions are taking place."

JOHN MEIER
ARTHUR ANDERSEN & CO.

Once the fundamental problems of communications and an integrated data base are solved, hospital MIS departments will have to turn their attention to absorbing new technologies. Bedside terminals, artificial intelligence and automation of many time-consuming nursing functions could become as commonplace as bedpans and plastic thermometers by the 1990s. But an infrastructure of real-time information systems that could support the load of all the data being created is far from falling into place.

"Like factories, hospitals have their own islands of automation," says John Meier, regional director of health care consulting at Arthur Andersen & Co.'s Chicago office. "We need to integrate these systems through networking and through the creation of common data bases. The key to automating hospitals is to look at where the transactions are taking place — whether they are at the admitting office, at the nurses' station or at the patient's bedside."

While the hospital of the future will not be built overnight, many large and mid-size hospitals — those with 300 beds or more — are already moving toward compatible systems and communications standards that will allow data to be collected and stored centrally.

No last-place finishers

Community hospitals, thwarted by fewer resources, may lag behind, but they needn't if the appropriate technologies are chosen, says Dr. Howard Bleich, one of the designers of the 4-year-old system at Boston's Brigham and Women's Hospital.

"The development of integrated hospital systems will require a consensus approach to computing within a hospital," says Bleich, a partner in the nonprofit Center for Clinical Computing, which supports systems at both Brigham and Women's and Beth Israel.

"We handle 3,500 pieces of electronic mail a day and handle 5,000 accesses of patient records each day at both hospitals," Bleich says. "And we do it by capturing the data as it is created, wherever it is created, throughout the hospital."

At Brigham and Women's, a single data base record is built step by step as a patient moves from the admitting office to his hospital room. The patient's treatment is tracked as he receives medical tests, and a universal record of his case is developed until he is discharged.

Behind the scenes is a central computer room of 12 DG computers, including Eclipse MV/10000s and MV/20000s, as well as older MV/6000s. This room, along with another at Beth Israel, is served by one computer services staff of 30 operations personnel and 30 programmers, Bleich says. This single-architecture approach is demonstrably effective, since it takes up just 1.5% of Brigham and Women's $275 million annual operating budget, Bleich says. This percentage is far lower than the industry average of 3% or more for DP systems. Patient billing results in payments within 90 days, down from the 175 days required before the system was installed in 1984.

But will this approach fly in other hospitals? Or will it be shot down by those unprepared to make the political concessions that precede the development of

Continued on page 69

Diagnosis with the touch of a finger

BY BECKY BATCHA

After six months in operation, the medical community's first commercially available on-line diagnostic system, DXplain, is winning some praise, taking some knocks and receiving important constructive criticism from doctors who dial in to use it.

"Fantastic. I love it," one physician writes, using an electronic mail feature that DXplain provides.

"Go fish," writes another.

"There was no [system] awareness of latrodectism [poisoning due to the bite of a spider]," says a third correspondent, adding that "black widow spider bites are common."

Dr. G. Octo Barnett, the system's main developer, sifts through the comments in his office at Boston's Massachusetts General Hospital, where he serves as director of the laboratory of computer science. Barnett takes the praise to heart and shrugs off the criticism, then moves without pause to add spider bites to DXplain's knowledge base of 2,000 diseases and 4,700 symptoms.

The ability to accept new information from one user and distribute it immediately to others is DXplain's most vital feature, Barnett says. Within three or four days of his addendum, any of the 8,000 doctors who subscribe to the American Medical Association's AMA/Net on-line service will be able to dial up DXplain and learn that a patient exhibiting a puzzling set of symptoms might very well have been bitten by a black widow.

DXplain is a sophisticated decision support program that matches a doctor's observations about a particular patient against its broad knowledge base of symptoms to generate a list of diagnoses that the doctor ought to consider. Unlike most expert system diagnostic tools, which rely on symbolic logic, the program uses straightforward probability and ranking schemes to reach its conclusions.

Barnett and his colleagues at Mass General wrote DXplain in the MUMPS language, which they developed in 1967. They run the system in-house on a cluster of Digital Equipment Corp. VAXs. The AMA helped fund the programming project and continues to support DXplain with a robust marketing effort.

Logic, not reason

Whereas other diagnostic expert systems try to mimic the thought processes a human expert uses to reach a decision, DXplain seeks only to link symptoms with associated diseases. The system can give users suggestions that any doctor with a very good memory might offer to a colleague. "It doesn't have the slightest idea of why," Barnett says.

By leaving out the reasoning behind a decision, DXplain's developers removed an obstacle that has prevented similar tools from reaching the offices of practicing physicians. Diagnostic expert systems typically advance beyond the prototype stage only after many years of fine-tuning — if ever. DXplain, on the other hand, became commercially available within 1½ years after development work began.

Barnett says it will take at least a year of feedback from users and upgrades by Mass General's technical staff to bring the

Continued on page 66

Batcha is a free-lance writer based in Boston.

Medical expert systems and diagnostic tools

A sampling of ongoing work

System	Institution	Specialty	Status
Abel	MIT	Helps diagnose acid, base and electrolyte disorders through anatomical and physiological modeling	Demonstration prototype
AI/Rheum	National Library of Medicine	Helps diagnose rheumatic ailments, using IBM Personal Computer AT-class sytems	Slated for field-testing this year at selected sites
Attending	Yale University	Critiques doctors' plans for the selection and administration of anesthesia	Research prototype
Congestive Heart Failure Program	MIT/New England Medical Center	Helps monitor drug treatment for patients with congestive heart failure, using a physiological model	Prototype slated for limited testing at New England Medical Center later this year
DXplain	Massachusetts General Hospital/ American Medical Association	Suggests general medical diagnoses through an on-line network	Available through AMA/Net since July 1987
HELP (Health Evaluation through Logical Programming)	LDS Hospital/ University of Utah	Monitors drug therapy, lab test results and other patient data; issues alerts to doctors and pharmacists; suggests therapy	In use at LDS Hospital; slated for up to 10 more installations this year
HT-Attending	Yale University	Critiques doctors' plans for the treatment of essential hypertension	Clinical testing likely within the next six months
Internist-1/ QMR	University of Pittsburgh	General medical diagnosis, using IBM PC AT-class machines	Completion likely within one year
Oncocin	Stanford University	Chemotherapy and monitoring of patients in experimental cancer treatment	In use at Stanford outpatient oncology clinic
Pathfinder	Stanford University	Lymph node pathology, using "belief network" approach to artificial intelligence	Prototypes in use at a few academic sites
Puff	Stanford University	Interprets pulmonary function lab tests	Commercially available
Reconsider	University of California at San Francisco	Prompting system suggests diagnoses for a wide range of symptoms	Research prototype in use for medical education at UCSF and other schools

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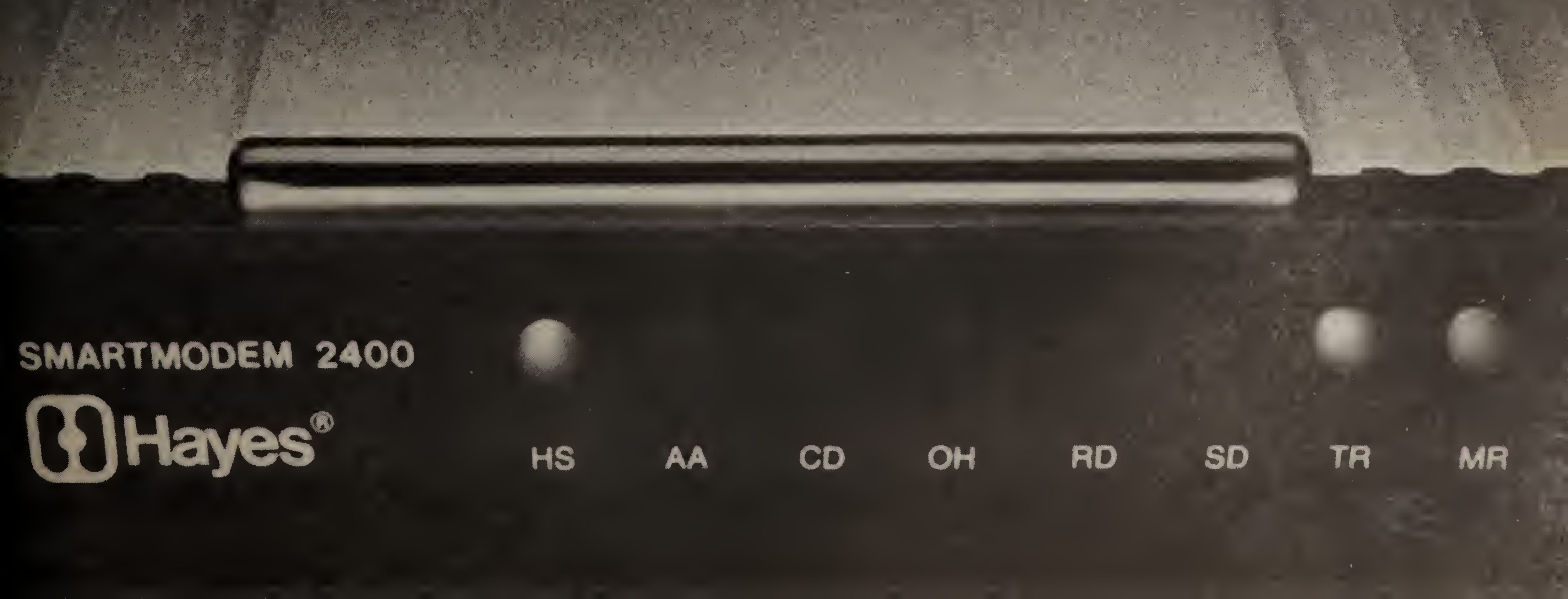

Diagnosis

CONTINUED FROM PAGE 64

system to the point at which he feels satisfied with its operation. But, he says, this period of give-and-take is part of the plan.

Like MUMPS — an inelegant language that can nevertheless piece together a prototype in no time — the DXplain project rests on Barnett's conviction that the best way to develop an application is to let users suggest changes. "The whole idea is to get them to respond and react to something they can put in their hands — rather than a piece of paper," he says.

By offering DXplain over a nationwide network, Mass General and the AMA are bringing hundreds of minds to bear on the project. Between 10 and 20 comments come in every day from doctors who use the system, multiplying the knowledge of the 13 physicians who served as advisers during the development.

Memory shaker

One of the system's most enthusiastic users is Dr. John Ring, a general practitioner from Chicago who serves as vice-chairman of the AMA's board of trustees.

Ring began using DXplain last summer and now turns to it three or four times a week for help with cases that stump him. He says DXplain jogs his memory the way a good medical text would, calling his attention to diseases he might not have considered. "It is not a doctor in a box, though," he says. "It doesn't make the diagnosis for you."

Users gain access to DXplain by dialing in to AMA/Net, which is marketed by Softsearch, Inc. in Abilene, Texas, and operates primarily through Compuserve, Inc.'s Compuserve Information Service. Membership in the network costs $55 for AMA members, $75 for nonmembers, and DXplain usage fees run to about $40 per hour. A typical session lasts 15 to 20 minutes.

A DXplain session begins with a prompt that requests a patient's age, gender and symptoms. The doctor enters the physical manifestations of the disease, the results of laboratory tests and similar observations; then the system goes to work. Within less than 30 seconds, DXplain searches its data base for matching terms and responds with a list of possible diagnoses, ranked in order of likelihood.

Using menu-based commands, the doctor can then work to clarify the findings. He can, for example, enter additional symptoms, request more information on some of the diseases listed or ask why a particular diagnosis ranks where it does. To justify a diagnosis, DXplain lists all of the patient's symptoms that support the diagnosis; it also lists additional symptoms the doctor might expect to uncover.

DXplain's ability to explain itself is among the system's most important features, according to Barnett, since developers of diagnostic systems have found through the years that doctors will not accept any findings on faith.

Indeed, Dr. Randolph Miller, whose Internist-1/Quick Medical Reference project at the University of Pittsburgh School of Medicine is one of the most highly regarded expert system efforts in the nation, explains that physicians are accustomed to judging information according to the credentials of its source.

Because they cannot tell whether a computer program takes its cue in any particular case from a brilliant diagnostician or a resident fresh out of school, doctors demand elaboration, Miller says. "What you need is a way of saying, 'Is this a bright idea or nonsense?' "

> "IT [DXPLAIN] is not a doctor in a box. It doesn't make the diagnosis for you."
>
> DR. JOHN RING
> GENERAL PRACTITIONER

Another of DXplain's distinguishing features is its broad scope. Most diagnostic software restricts itself to an extremely narrow area of expertise.

The feature that people in the medical community praise most, however, is the system's practicality. No other software comes close to entering the working physician's life on anywhere near the same scale. As the first widely available diagnostic system of note, Miller says, DXplain marks a milestone in medical informatics.

While a boon to many in the medical field, the system is not without drawbacks, as Barnett is quick to note. For example, although its broad knowledge base appeals to general practitioners, the knowledge is not deep enough to help specialists in any one field. More critically, the system cannot handle causal relationships between symptoms and diseases.

In addition, DXplain's vocabulary needs to grow so the system can understand most of the clinical observations that doctors describe, Barnett says. It currently fails to accept about 10% of all input. DXplain also must be able to recognize more psychological symptoms and diseases and more laboratory test results.

Still, Barnett says Mass General and the AMA have taken the proper approach. By putting something in doctors' hands — even something with gaps and imperfections — he and his colleagues have helped advance the state of the art.

Barnett says he cannot quite imagine what shape DXplain will take once users' suggestions whip it into its final form. "But," he adds, "I'm sure we're on the right trajectory." •

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INTERVIEW

CIO writes MIS Rx

Are CIOs destined to play a role in the new lean-and-mean health care industry? Yes, says Michael Carrico, American Medical International's chief information officer, but only if they use information systems to meet business goals.

Michael Carrico is a member of an elite management group. He is a CIO in the cost-conscious health care industry. Carrico, as senior vice-president and CIO of American Medical International, Inc. (AMI), is responsible for providing information services to about 45,000 employees in more than 100 hospitals worldwide.

Carrico, AMI's first CIO, joined the company in June 1987. By his own admission, he has no health care background, which he says has been an asset. He does claim a solid set of general management skills and a technical background of 25 years spent providing information system services.

Carrico embarked on his DP career as a computer operator on the night shift, working his way to a degree in economics at the University of California at Los Angeles.

He went on to earn an MBA in finance, work for Douglas Aircraft Co. and start his own business. He came to AMI from Compass Computer Services, Inc. in Dallas, where he was president and chief executive officer for five years.

As CIO of Beverly Hills, Calif.-based AMI, Carrico also holds the title of president of AMI Information Systems Group, Inc., a wholly owned subsidiary. Originally, the subsidiary provided information services to independent health care companies as well as to AMI hospitals. As Carrico came on board, however, the company divested itself of outside interests and is now responsible for providing services solely to AMI's hospitals.

The CIO has overseen a streamlining of the information systems staff and is currently examining the relationship between fundamental information services and AMI's business plan. He recently spoke with *Computerworld* New Products Editor Suzanne Weixel about the role of the CIO in the health care industry.

Why did AMI decide to appoint a chief information officer now?

In the past, the information systems orientation was toward technical people fulfilling technical needs. Today, the goal is to provide systems that are determined by business requirements. The need arose for someone to manage the Information Systems Group [ISG] and to report directly to the chief executive officer.

When the company decided to stop providing information system services to outside hospitals and to focus on internal systems, the decision was made to bring in someone involved in the information systems area who could also be involved in the general management of the company.

AMI is in the health care business, not in the systems development business, so the plan was to make ISG a bona fide service group, its main mission being to support AMI's hospitals. The CIO is a fairly new position all around, as is the reporting relationship it presents.

I am one of five people reporting directly to the chief executive officer. The direct access from information systems to the CEO is revolutionary.

Considering your background, what qualifies you to be a CIO in the health care industry?

A qualified manager can bring the necessary information systems expertise to any industry. If you are capable of determining what you need to know and then bringing your information systems expertise into the context of the business, then you can be effective at the top level of management anywhere.

What specific knowledge does a CIO need to bring to the health care industry?

You've got to have an awareness of how difficult a business environment it is. We are currently in an overcapacity situation, meaning that well into the next century there are going to be more beds than there are patients to put in them.

There is also enormous pressure coming from both the public sector — the Medicare area — and the private sector to bring costs down.

So, although other industries are in competitive situations, ours is in an extremely difficult position as well.

To remain competitive, we not only have to continue to provide the best quality of care possible, we also have to bring costs down. It is absolutely imperative to be a well-managed company in order to make it.

It's a very tough business, but when you look forward to the 1990s and see the size of the piece of the gross national product pie that health care represents, it is a very exciting business to be in.

How does information system services contribute?

The most significant contribution is making sure that the things we do are practical, realistic and supportive of the business. That's where a CIO fits in. The CIO is able to keep the information systems business in perspective with the general company business.

Because of such factors as increased competition and cost-containment measures, the ways we traditionally used to manage the health care business are being challenged.

In the past, I don't think systems were always integrated with the overall business plans. AMI has been a successful health care company — it was the founder of the health care chains back in the '60s — and it's always been profitable. Now, the lack of system integration threatens to catch up with us.

Throughout the industry, companies are becoming so concerned about the costs and risks of developing information systems that if it is possible to buy rather than develop them, they're going to buy.

That's a departure from the norm. I believe that, in the next few years, we will be buying a new information systems architecture to replace our old in-house-developed applications systems.

As a newcomer, are these ideas ones you brought in from outside the health care industry?

The view to buy rather than develop is something I put forward as the rational way to manage the information systems business.

ALAN WITSCHONKE

Michael Carrico

Senior management agreed and endorsed it as a philosophy to follow wherever practical. I think we can put the software in place faster that way; there's less risk, and we can do it for less money. It makes sense.

What is next for a CIO? Is there a future for the position?

A good CIO is someone with broad management experience. The CIO is just as logical a candidate to become CEO as anyone else in the company. Of course, we'll have to earn our way.

So much of it depends on the individual — your charisma, what kind of manager you are, how effectively you can present your ideas.

As people from information systems become CIOs and achieve a senior management reporting relationship, they will have the opportunity to be judged in the same context as their senior management peers. Then it's just a matter of time and circumstance. •

Shaking off

CONTINUED FROM PAGE 64

the unified system?

It is important to note that Brigham and Women's computer architecture hinges on some very critical primary conditions. Among these are that there is no separate computer for patient billing (the IBM mainframe was removed several years ago), that every department agreed to use DG-based applications, maintained by a central programming staff, and that data is spread around the institution for easy access by nurses, doctors, technicians and administrators alike.

"Typically, the fiscal system is doing nothing to support end users and patient care, and we don't have a separate fiscal system," Bleich notes. Just one-third of all computing time now goes to fiscal applications; yet user interfaces and their maintenance are just as important, Bleich asserts.

"We believe that computer systems must fit functionally with what the end user does and that ease of use is inversely proportional to the thickness of the user manual," he says.

> "WE ARE automating every aspect of the hospital as we try to get our costs down and keep our quality level up."
>
> FRED PIRMAN
> HUMANA, INC.

Remarkably, there is no user manual at Brigham and Women's. Instead, supervisors work with MIS to revise screen formats and then pass on information about user access methods directly to end users. Practice sessions in which fake patients are admitted, treated and discharged are used to train new personnel in the computing techniques.

Such a system may be unique in its details, but other hospitals are beginning to build their own systems with similar goals.

"The whole notion of using information systems for competitive advantage is beginning to take hold," says Mark Gross, national director of Health Care Information Services at the consulting firm of Ernst & Whinney in Cleveland.

Why didn't hospitals automate earlier, joining their manufacturing colleagues in gearing up for communications standards and common data bases?

Gross, a longtime observer of the hospital scene, offers a simple answer: "Before the federal cost guidelines came in, hospitals were reimbursed for their costs, so there was no incentive for them to integrate their computer systems."

HCA's move to link all its departmental Towers was first instigated by user requests. According to Terry Armstrong, assistant vice-president of client services for HCA's Information Systems group, "Our users said that these stand-alone systems should talk to each other so that they wouldn't have to re-input data from one stand-alone system to another."

But HCA, according to Armstrong, doesn't believe hospitals need a shared computing environment. "Each department [including laboratory, nursing, radiology, order/entry and pharmacy applications] is a separate production unit, with separate applications supporting its activity," Armstrong says.

Physicians, however, may tap into HCA's Towers or the central site mainframes through a prepackaged IBM Personal Computer AT that has been modified with software from HCA. The PC is installed at physicians' offices to allow the doctors to track their patients' hospital stay.

However, a central mainframe site in Nashville, housing an IBM 3090 Model 200 as well as three IBM 4381s for development and testing, serves the entire HCA system.

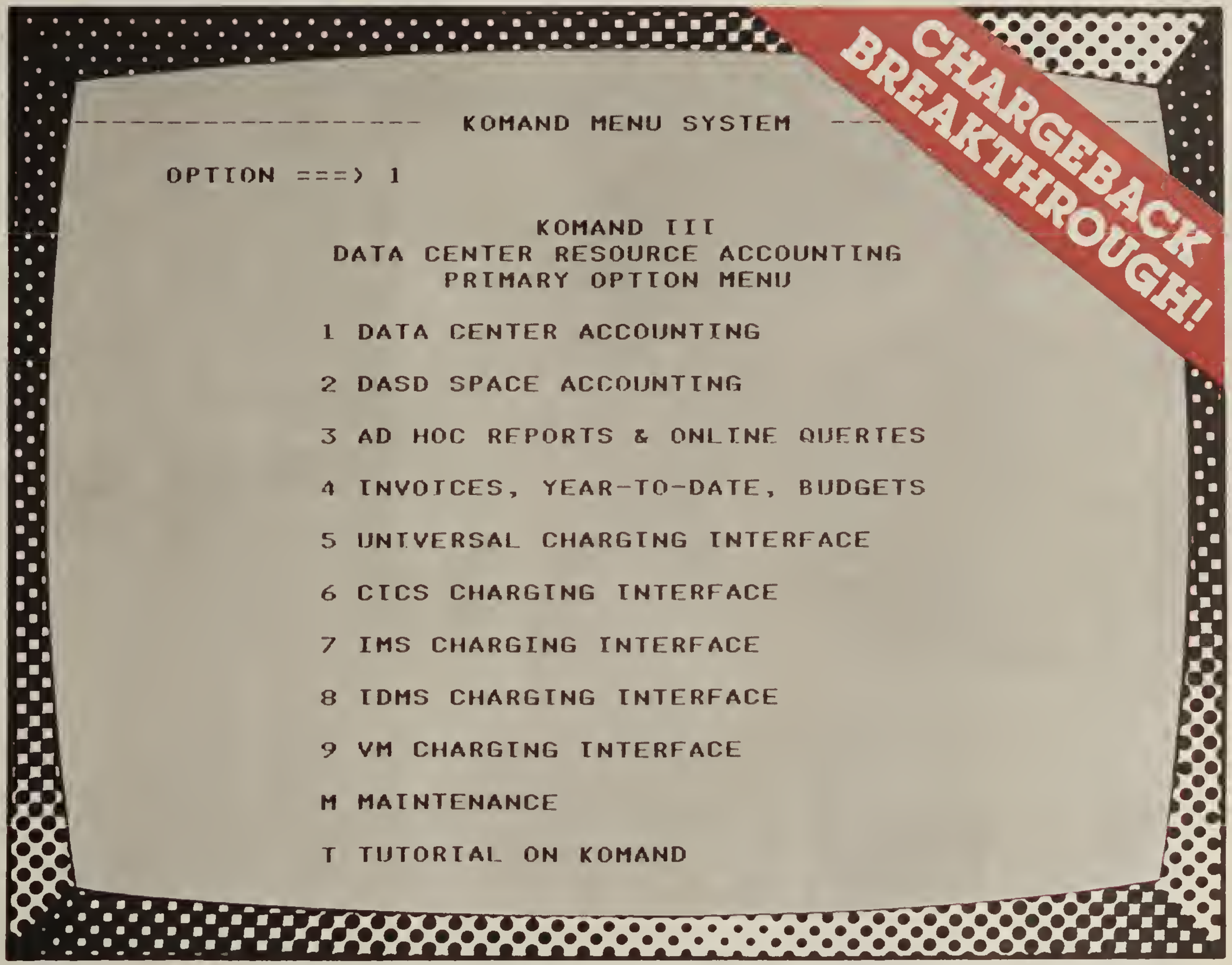
Once all the stand-alone Towers are networked through the Hlink software, Armstrong said, each department will be able to update a centralized data base maintained at the central Nashville site.

Making the transition

The transition to the integrated health care systems of the 1990s need not be abrupt, and hospital MIS managers need not be pioneers. Questions about communications standards have already been answered by international standards like Open Systems Interconnect and Manufacturing Automation Protocol/Technical and Office Protocol. New kinds of relational data base structures are also available, and artificial intelligence is fast becoming a reality.

Bedside terminals are becoming a

Continued on page 74



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Some of the finest physicians in the Midwest practice at Jewish Hospital in St. Louis. It's an excellent hospital with an excellent reputation. But it *is* a business, and recently, due to a desire for better information access and control, Jewish Hospital found a need to convert from a shared computer system to a private one.

So after very careful consideration, Jewish Hospital converted to Financial, Human Resource and Materials Management software systems from Management Science America, Inc.

"Initially, we looked at 15 software companies," said John McGuire, executive vice president of the hospital. "In making our evaluation, we considered solicitations and talked with the users of various systems. We then considered five finalists who gave presentations. Then we narrowed our choice down to two, and ultimately went with MSA."

Why MSA over all the other software companies?

"User satisfaction with their products," was one of the reasons McGuire cited. "Also, MSA's customer service reputation was very good. We feel we made the right choice by going with MSA."

Now that MSA and Jewish Hospital are working together, the hospital is integrating its operational and financial information. According to McGuire, "MSA is helping us take better care of the business side of our hospital...and that lets us take better care of our patients."

If you would like to know more about what we're doing for Jewish Hospital, or what we can do for your business, contact Robert Carpenter in Atlanta at (404) 239-2000.

MSA The Software Company

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Optical disk systems sharpen X-ray image

BY BARBARA SEHR

A picture may be worth a thousand words, but a computerized image of a spinal cord or heartbeat produced by today's generation of ultrasounds and other radiological devices is likely to use up a full megabyte of storage space.

As a result, these images are usually stored on special photographic film and viewed by doctors in much the same way as photographs of a vacation trip. But recent strides in medical imaging technology promise to change the old ways of reading X-rays and other images.

Until recently, computer storage and display technology has been slow in keeping up with the image-gathering devices hospitals commonly use.

A new generation, however, of optical storage systems, image display terminals and software is advancing the versatility of these recording devices. Image storage on optical disks provides users with instant access to the pictures from one central source. Rather than have photographs scattered in different doctors' offices, a hospital network can provide image access to many different doctors at the same time.

> HEALTH care "is a logical place for optical storage. There is a lot of information to be stored and a definite need to preserve it."
>
> RICHARD FISHER
> KALTHOFF-FISHER
> ASSOCIATES, INC.

Using advanced display systems, these images can be manipulated and refocused. In addition, three-dimensional images can actually bring out detail never before seen by medical technicians. In the most recent advance in software, images can be sent by satellite from remote sites for examination by top radiologists in large medical centers.

Health care "is a logical place for optical storage," says Richard Fisher of Kalthoff-Fisher Associates, Inc. in Los Gatos, Calif., and a consultant on imaging for The Yankee Group in Boston. "There is a lot of information to be stored and a definite need to preserve it."

While medical imaging is still a very fragmented and small part of optical storage, pioneers in what is now known as picture archiving and communications systems (PACS) are beginning to spend money to advance the technology's cause.

One sign of increasing interest is an annual conference on the technology scheduled from Jan. 31 to Feb. 5 in Newport Beach, Calif. The conference is sponsored by the International Society for Optical Engineering in cooperation with the American Association of Physicists in Medicine, the American College of Radiology and the Center for Devices and Radiological Health.

The technology recently received a boost from Digital Equipment Corp. when the company announced a joint effort with Siemens Medical Systems, a health care OEM. Under the agreement, DEC will supply VAX processors for Siemen's PACS, along with networking software that will allow the PACS to send the digitized images throughout a network.

A spokesman in DEC's health care industry group says the networking software is the key to the agreement. "The health care community is beginning to recognize that there is more to PACS than hardware," he adds.

DEC is also recognizing the importance of PACS through a $100,000 equipment grant to the Malincroft Institute Radiology Center at Washington University in St. Louis. The Malincroft Institute research is one of several PACS demonstration projects now under way, some partially funded by the federal government through the Department of Health and Human Services.

One of the largest projects is funded in part by the National Cancer Institute at the University of California at Los Angeles's (UCLA) medical school. The project began with the conversion of the school's pediatric radiology department to an optical disk-based image storage system. Ultimately, all radiology images at the huge 750-bed teaching hospital will be recorded on an optical disk archiving system developed by Filenet Corp. in Costa Mesa, Calif. When completed, it will enable doctors to look at and manipulate digital images on an imaging system.

The pediatric radiology section at UCLA produces some 209M bytes of images each day. Filenet's optical system stores all of this data on only 29 optical cartridges per year. Because of the experimental nature of UCLA's system, all images are backed up on a second cartridge.

Image display systems, like the one used at UCLA, have taken a quantum leap from the fuzzy, two-dimensional black-and-white displays commonly seen on "state-of-the-art" ultrasound equipment in most U.S. hospitals. Images on present-generation display systems can focus deeply into a spinal column, freeze an area and rotate the image until imperfections are detected.

Software developed for medical imaging systems by William Barrett, an assistant professor of computer science at Brigham Young University in Provo, Utah, allows the images to be rotated on a central axis in real time — meaning doctors no longer need to wait until a film is developed to see an animated rotation of an X-rayed image. "This rotation brings more information about depth [of a captured image]," Barrett says.

Locating the source

According to one vendor, patients have already enjoyed pain-saving results from the emerging technology. Stephen J. Weiss, executive vice-president of Virtual Imaging in Sunnyvale, Calif., recalls one such patient success story.

In this case, a woman complained of severe back pain. Tests using 2-D radiology images suggested the patient undergo delicate surgery. However, even after the operation, the patient still complained about the pain.

Finally, doctors examined images of her spinal chord using Virtual Imaging's system with 3-D imaging capability. The rotation of her spinal chord image detected a microscopic calcium spur. The spur was removed, and the woman's back pain ended. "Ordinary X-rays would never have located the problem," Weiss says.

In another demonstration of PACS, the University of Pennsylvania Hospital in Philadelphia is sending images from a remote diagnostic clinic, located 25 miles from the main hospital, for examination by radiologists at the university.

"It means we don't have to send a radiologist to the clinic to review images and make a diagnosis," says Sridhar Seshadri, lead engineer of the university's PACS project.

The software making the transmission project possible was written at the university, completely overhauling the front end of a Virtual Imaging terminal. The university buys bulk transponder time from a satellite transmission wholesaler.

The primary workhorse monitor of UCLA's system is a Gould, Inc. IGD IP8500 image processor with its own 20M-byte internal image memory and a 1,000- by 1,000-bit resolution. A third monitor being tested is a 1,900- by 1,900-bit resolution Mitsubishi Corp. radiographic review station that has an internal image processor.

Dr. Nicholas J. Mankovich, assistant professor in the Department of Radiological Sciences at UCLA also found "the Mitsubishi terminal to be the best for patient diagnosis." The hardware for the UCLA project was put in place with the installation of a computed radiographic system in September 1985 to create digitized images. The optical archiving system and manipulation monitors were added in the summer of 1986. The entire system is operated on a fault-tolerant basis: Everything in the system is redundant.

In addition, radiological images are still created and stored in the old-fashioned way — on film. "We're still operating in parallel," Mankovich says. "We haven't pulled the plug on the old system yet."

Nevertheless, midway through the evaluation, Mankovich seems assured that his picture archiving and communications system will set the tone for installations in large hospitals across the country. •

Sehr is a free-lance writer based in Seattle.

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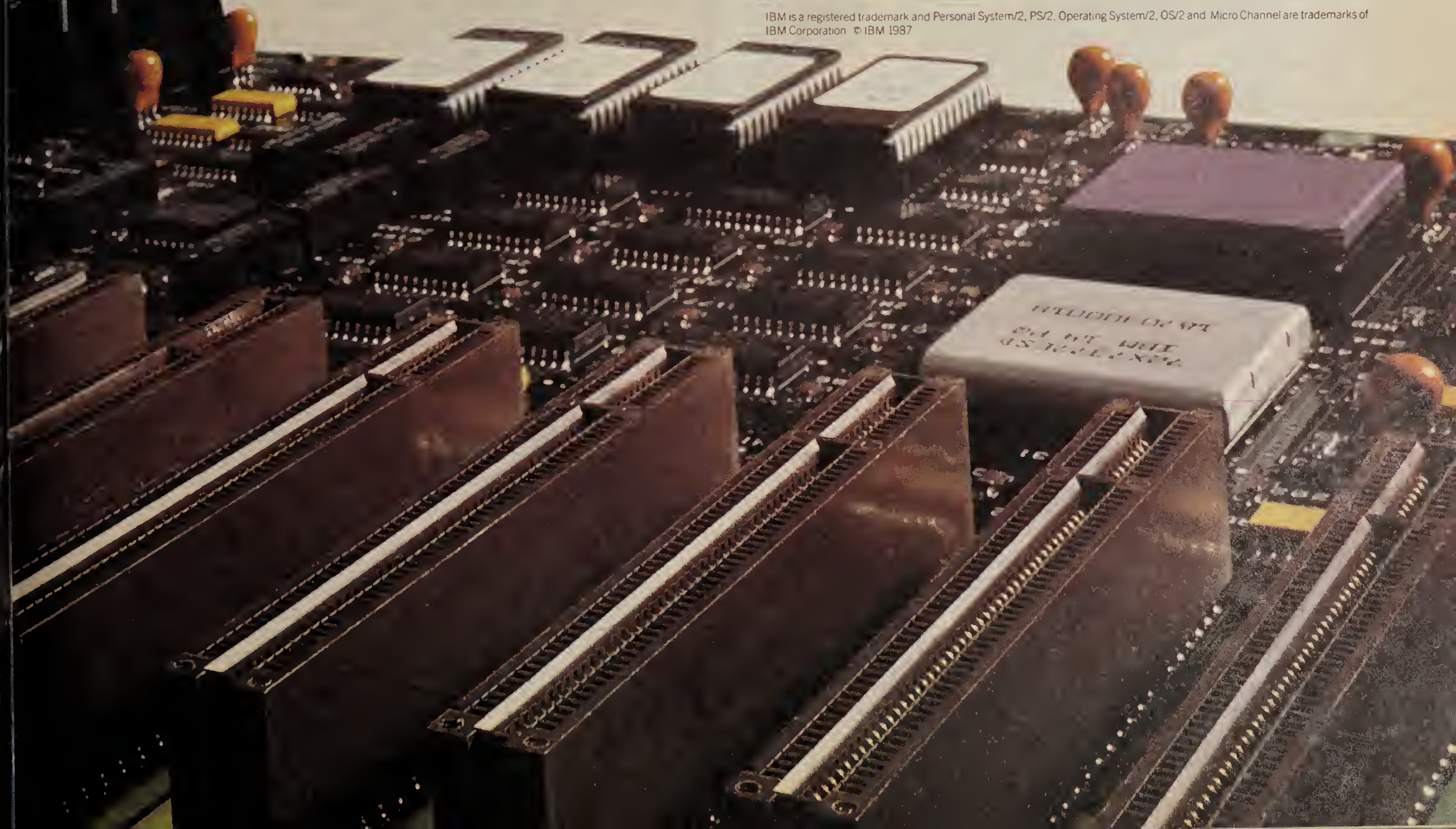

Shaking off

FROM PAGE 69

reality at a handful of institutions, including Humana, Inc., the Louisville, Ky., operator of more than 400 hospitals throughout the U.S. Physicians' systems, based on IBM Personal Computers, are also being developed as a way to keep doctors on-line with Humana patient care systems.

At Humana, two large IBM mainframes, a 3090 Model 600E and a 3084, handle the bulk of the administrative work, says Fred Pirman, senior vice-president of information systems. However, the company is reworking the way in which departments are automated.

"We are automating every aspect of the hospital as we try to get our costs down and keep our quality level up," Pirman says. "We are automating processes that are not even touched by the mainframe, such as insurance and laboratory applications."

Humana, which operates 85 hospitals throughout the nation's Sun Belt states, including California, Florida and Texas, is in the middle of a three-year phased implementation of DG-based systems. The new systems, based on MV/6000, MV/10000 and MV/20000 superminicomputers, track patient care throughout Humana's managed hospitals.

The health care company is also marketing a personal computer-based physician system that allows referring doctors to access electronic hospital files at Humana-run hospitals from the comfort of the doctors' offices. Some observers say the hospitals that develop such links with physicians' offices are really ensuring a continued cash flow through repeat business.

Making it simple

As the largest of the for-profit hospital corporations, Humana is a trendsetter. But large, independent hospitals of 600 beds or more, as well as mid-size 300-bed hospitals, are already looking for ways to bridge the unrelated computer systems under their supervision. At Community Hospital of Indianapolis, the focus is on simplifying a complex computing situation that developed in the last 15 years.

"At one time, departments selected software applications first and then bought the hardware to support them," says Martha Roth, assistant director of information systems at the Indianapolis hospital. "That blossomed to the point where we had 13 different computer systems. We did interface them, but operationally, it was costing us a lot to do that."

Now, the trend is moving toward a smaller number of systems, including several Tandem systems to handle patient care and one IBM mainframe to handle financials. Roth says the Tandem system, which has grown in size in recent years, lends around-the-clock uptime to the hospital applications.

"You don't have to take the machine down for backup," she says, "and all our disk drives are mirrored." This means that even if one of six production Tandem CPUs fails, the data is never lost through a cold start. Other Tandem processors are used for testing and developing new applications.

As the revolution in hospital systems continues, there will probably be more fault-tolerant transaction processors, like Tandem's, on the scene. At Eisenhower Medical Center in Los Angeles, four Tandem applications cover most hospital information needs, says Jo Carol Conover, health care industry marketing manager at Tandem in Cupertino, Calif.

"Hospitals really have a need for features like on-line transaction processing," she says. "Theirs is a business that never stops. There is no third shift when it's all right to take the system down."

Tandem systems are used in three ways in the hospital, Conover says: to drive a backbone network that binds departmental systems and remote locations together, as a host for integrated applications and as a stand-alone system for laboratory, pharmacy or radiology applications.

Try it out

Whatever their design, the success of any changeover to new-wave hospital systems will be dependent on MIS's willingness to give new things a try.

"Hospital environments are among the most complex computing environments there are," Conover says. "It's very hard to get people to throw out old systems, especially when they've developed in-house applications to run on those machines." This is why Tandem has to work with consultants and third-party software vendors to develop and market new Tandem-based hospital systems.

Martha Roth

The potential for growth is great, however. According to Conover, Tandem maintains that health care will be one of the company's fast-growing new application areas. In 1987, Tandem gained 26 new customers for its U.S. hospital installations to bring the total to 90.

Whatever the system, end users must be brought into the process if new hospital systems are to succeed. At the University of Missouri-Columbia Hospital and Clinics in Columbia, Mo., nurses are beginning to work with bedside terminals and IBM PC-based applications to customize treatment plans for patients.

"We have a couple of departments that use the new systems all the time," says Lois Nauert, coordinator of nursing information systems. "Some nurses love the systems and would hate it if anyone talked about taking them away." Others are not yet comfortable with the technology, she says, and do not tend to use the systems very much.

The future may have already arrived on some wards of the Missouri hospital, judging from the degree of end-user acceptance. In four of the 20 nursing units, nurses use the bedside systems to create and print medical charts. "The nurses in those units are using the bedside systems to calculate intravenous drip rates and to track a patient's temperature," Nauert says. "They're so glad they don't have to handwrite those patient charts that they've thrown away their pens and paper." •

Seizing the software market

Sensing an opportunity of major proportions, hardware and software vendors alike are rolling up their sleeves and digging into the medical market. They are preparing applications that meet the new federal reimbursement requirements for medical procedures and writing communications software to tie disparate departmental systems together.

IBM, the market share leader in hospital and health care systems, is reportedly hiring heavily in the Atlanta area, preparing new rafts of medical software to sell. Tandem Computers, Inc., while not selling directly to end users in hospitals, has arranged to make sales of its fault-tolerant equipment through third-party systems integrators like McDonnell Douglas Health Systems Co.

Digital Equipment Corp. and Data General Corp., both strong in laboratory, pharmacy and radiology systems, are trying to leverage that strength into the financial area, once dominated by IBM and the former Burroughs Corp., now part of Unisys Corp.

IBM's Patient Care System and the Burroughs Hospital Information System are the two most firmly entrenched integrated hospital applications. Both combine patient billing with patient care records, allowing administrators to ask "what-if" questions about patient care and its relationship to cost.

"IBM is dominant on the financial side, while DEC is dominant on the clinical side," observes David Rousseau, vice-president of marketing and planning at McDonnell Douglas Health Systems in St. Louis.

McDonnell Douglas, which runs one of the two largest remote data processing operations for hospitals (Shared Medical Systems Corp. in Philadelphia runs the other), is writing new stand-alone hospital applications that clients can use if they decide to drop the remote processing service. Shared Medical Systems is also developing stand-alone systems for its mainframe hospital applications.

The target market for all these systems is hospital information systems managers at hundreds of the largest institutions among the U.S.'s 5,800 hospitals.

JEAN S. BOZMAN

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Tangible losses

How to shape an information policy that won't let data slip through your fingers

BY JAMES SCHWEITZER

ANTHONY RUSSO

Ask almost any business executive, "Who manages your information resources?" and you will hear "I don't know," "We've never thought about it" or "The systems manager."

Despite the real and increasing threat of information exposure or loss, many companies ignore the risk. In survey results published in August 1987, *Computerworld* reported that less than 16% of banks, less than 8% of financial services businesses and less than 5% of manufacturing businesses invested in encryption or port control systems for their networks.

Such data is not conclusive by itself, but it implies that many companies today do not adequately protect their business information. Considering the investment most companies make in information — IBM spends 7% of its sales revenue on information systems — it is strange that so many information executives today spend their time just trying to control data processing costs.

I recently heard about two employees whose job it was to destroy documents from "burn boxes" — repositories in which confidential documents are placed to prevent them from ending up in the public trash system.

The employees, who were janitorial-level workers, made a practice of carefully reading each document before throwing it into the shredder. They apparently had been given no sense of the purpose of their job, which was precisely to prevent such casual perusal by people with no need to know.

Case studies

Information losses can be considered from four viewpoints:

- The circumstance of loss or exposure.
- The identity of individuals stealing, destroying or observing the information.
- The medium (mental, written or electronic) involved in the loss or exposure.
- The value of the information.

Consider some actual cases:

Case 1: The inside job. During labor contract negotiations, managers of a brewery in the UK were surprised to find that union negotiators knew details of the company's financial situation and business plans. The brewery traced the information leak to a data center employee who had been taking printed reports home. The employee had found a customer for the information — the union — and had been making additional income by delivering copies of certain business reports.

Circumstance: Purposeful exposure by an insider.

Identity: Trusted insider.

Medium: Printed report.

Value: High subjective value.

Was there an active program in effect to identify valuable information and train employees about how to handle and protect it? Were supervisors aware that information processed was private to the company? Did anyone

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Schweitzer is systems security technology manager at Xerox Corp. in Stamford, Conn. He has written five books on information security, including *Computers, Business, and Security* (Butterworth Publishers, 1987) and *Protecting Information in Local Area Networks* (Butterworth, 1988).

……

• Who keeps your information safe?

• A high-level responsibility

• Dealing with data on paper . . . still

check employees leaving the building to see what they might be carrying out?

Case 2: Electronic leaks. An engineering employee at a well-known computer manufacturer used his network connections to compile a detailed technical description of a new product. A portion of the material was then published in a technical journal, exposing the company's sensitive strategic thrust.

Circumstance: Insider passed information to an outsider.

Identity: Trusted insider.

Medium: Information in electronic form.

Value: High subjective value.

Did the network have sufficient security for the information files that were accessed to assemble the description? Was the originator of the description aware of the data's sensitivity? Had management made clear that such distribution of strategic technical data was regarded as a serious breach of regulations?

> ENSURING that quality information is provided for business operations is not a one-shot deal or cursory effort.

Case 3: Leaving no trail. A clerk taking telephone orders for "ABC Corp.," a wholesale distributor, discovered orders could be placed, without her being identified as the originator, for a false address by passing information to an accomplice on customer credit. The clerk's boyfriend rented a truck and picked up orders set up on the warehouse dock. In several months, the two stole thousands of dollars worth of merchandise.

Circumstances: Insider passing data to outsider.

Identity: Trusted insider and untrusted outsider.

Medium: Verbal information via telephone.

Value: Moderate subjective value.

Were customer credit records properly controlled? Was clerk record access justified and the transaction recorded?

From these cases we see that information loss or exposure resulted from two common failings: First, management had not identified, or had not provided suitable protection for, valuable information. Second, employees were not properly screened, trained or motivated.

Up to par

We know that quality information is essential to businesses today — but what, in fact, is it?

Quality information is information that meets management requirements for integrity, reliability and privacy. These characteristics are achieved through the proper management and control of the information resource.

Specifically, quality information results when the following goals are achieved:

- Information is properly identified, classified and managed as an important resource.
- Information systems and manual information procedures are correctly designed, installed, maintained and audited.
- Employees are suitably trained and supervised.
- Controls and separation of duties are established that are appropriate to the information's value.
- Information security is provided based on established policies covering classification and handling.

Ensuring that quality information is provided for business operations is not, therefore, a one-shot deal or cursory effort. Rather, it is a result of carefully planned management efforts that involve almost all aspects of business operations.

Information directives

Managing information is a broad, high-level responsibility involving strategic planning. And management must create a structure of information directives to ensure its control.

The highest level directive of this kind is an information policy. This document briefly spells out management requirements for identifying and controlling valuable information. The policy should cover all important aspects of the subject matter. Most of the ineffective policies I have seen failed because management did not recognize that all information — not just computer-processed information — must be protected. The same data often appears on both typewritten reports and computer printouts. What value is gained by protecting one and not the other?

Limit the policy to permanent requirements. For example, a policy statement that says, "All company classified information shall be marked and protected from exposure, loss and unauthorized change" is a valid policy requirement. But a statement that reads, "Only opaque No. 10 envelopes shall be used to transmit company classified memos" is not.

An effective policy includes these characteristics:

- It is published, promulgated and given visible support by top management.
- It covers all the permanent requirements of management concerning the subject matter.
- It does not include operational details that may vary from time to time or from one operating location to another.
- It meets the tests of longevity (it should seldom if ever need to be changed) and observance (people know about it and follow its prescriptions).

Information being an intangible, many employees find it difficult to understand

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why managing it is important. Furthermore, the steps leading to management control of — and legal rights to — information is often tedious in terms of daily business operations. For these very reasons, writing a sound policy is an essential first step.

Policy contents

In most companies, the information executive and his staff prepare the information policy. Subjects covered include the importance of information to the company, company classification nomenclature and definitions and the responsibilities of key employees, including the executive information manager, the systems manager, the data base manager and the security manager.

> IN A typical business today, probably only about 10% of all information should be classified. Less than 1% of all information should be at the highest classification level.

The policy should also cover statements of requirements for the marking, handling and availability of company classified information, defined for each company classification type. These should cover paper handling, data processing and telecommunications. Finally, the policy should include a glossary of terms.

Not everything can be protected effectively. A careful analysis of what is really important can provide better security and reduce the cost of protection.

In the 1960s, the U.S. Strategic Air Command decided that having guards and fences around its air bases was not necessary. Every test attempt at penetration showed that fences kept out only one's friends.

The Strategic Air Command then decided to place guards around only the important things — the airplanes, hangars and critical supplies — and not worry about people coming over the fences. This measure actually increased the level of security where it was really needed, and it saved money.

For the information resource, we need to take a similar approach — identify the truly critical pieces of information and follow a well-planned program for protecting them. Classification is the first step in this process.

In a typical business today, probably only about 10% of all information should be classified. Less than 1% of all information should be at the highest classification level. This tiny fraction represents information available to only a few people, and it should be locked in a safe or encrypted for electronic storage or communication.

The remaining 9% of highly valuable information would be classified at a medium level and be restricted to classes of employees needing it to do their jobs. Finally, all information regarding employee, medical and applicant records should be classified to ensure privacy.

Which is which?

The first task is to identify which information should fall into which of these classifications. While this decision is always a matter of judgment, a set of guidelines is necessary to maintain some consistency.

Keep in mind that classification decisions will be made by many people in widely varying circumstances. Although responsibility for classification rests with the information owner, practical business operation indicates that these decisions be made on the spot by the information originator, probably following instructions set up by the information owner within company policy.

At Xerox Corp., the company guidelines for classifying information are the following:

- Xerox Registered (highest classification): Information that if improperly disclosed could cause serious damage to company operations. Examples: information concerning product strategies and product-related research.
- Xerox Private (middle classification): Information that if improperly disclosed could have a substantially detrimental effect on company operations. Example: customer lists that would be of value to a competitor.
- Xerox Personal (special classification): Information an individual might find embarrassing or detrimental if improperly exposed. Example: personnel and medical records.

These definitions do not mention information retention or legal requirements, which should also be addressed through classification. However, they do provide practical guidelines for people who must make classification decisions.

A classification philosophy

Information should be classified to represent the business requirements for information security and availability and meet legal requirements. We may consider these as falling into two categories:

"Objective" relates to requirements outside the information itself. Generally, these deal with information retention and conservation, which are most frequently required by law or for historical purposes. This classification is typically marked "Retention Schedule X" — the "X" being a number referring to a list showing requirements.

"Subjective" relates to the information itself. Generally, these are requirements relative to the company's need to keep the information private. The

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business privacy requirement usually results in three information groupings:

- Information restricted to a small group. This category is specified when the information is developed by the originator or top management. This is the highest classification.
- Information restricted to a group of employees, not usually specified by name, who require it to perform assigned tasks. This is the middle-level classification. Special subjective classifications, such as medical records, fall within this group.
- All other business information that may not be released to outsiders without the approval of a manager — typically the information owner or the functional executive with responsibility for the information.

> PEOPLE often say, "Why mark something valuable? It just shows the bad guys what to steal."

Subjective classification decisions are made in two ways: first by the information owner, who specifies that certain types of information will always be classified at a certain level; second, by various managers and executives, who must make classification decisions on the spot as information develops. Therefore, all employees must receive training on making classification decisions.

Objective classifications are usually made following published company instructions for records retention or concerning requirements of law.

Another consideration is end-of-life. Most information has a fairly short value period. Within a few months, or certainly within a few years, most information has lost all but its historical value.

Therefore, it is a good idea to set expiration dates or periods. This can be done as a standard practice, in policy or by a declassification date. Such practice allows more reasonable destruction practices for records retention purposes and reduces the cost of secure storage for long-term documents and computer records.

Against classification

People often say, "Why mark something valuable? It just shows the bad guys what to steal." Such a position sounds reasonable, but it is not based on solid experience or law.

Major companies with notable success in competitive environments know it is neccessary to classify information. Without classification, nothing is protected. And they know that to prove ownership of information in court, they must show a real effort to identify valuable data. Classification is the answer.

The procedures used to protect information follow from its assigned classification. We will follow such a process in an imaginary company, XYZ Corp., which grows and sells specialized ocean plant life developed through genetic engineering.

Daniel James is a biologist at XYZ who has been working to develop more efficient ways of feeding crustaceans. James believes he has found an important and novel form of plants for this purpose. He has just finished writing a report to the XYZ chief scientist concerning this discovery, using his microcomputer word processing system.

James gets out his regulations booklet and looks up definitions of the XYZ. The instructions say that any new research results that could have product implications are to be classified as XYZ Registered, the highest company classification.

From the font file, James retrieves the XYZ Registered logo and places it electronically at the top of his report. At the same time, the system sets a flag on the computer record, which will indicate to all other XYZ systems that this is a registered document that must be handled in special ways.

James now sends the document to a printer. Because of the flag, the printer will not produce the printed paper until James arrives and enters his password. When James retrieves the document from the printer, the XYZ

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At XYZ, all research documents are maintained in a special library. James takes the original document to the library and has a copy made. From now on, no one will be able to get a copy of the document from any source other than the library. James, or any other XYZ employee, is not permitted to make copies of XYZ Registered documents.

Knowing he will be attending a company meeting in Chicago in a week, James informs the librarian. The librarian will send a numbered copy to the XYZ office in Chicago, and James will pick it up there. XYZ Registered documents are not permitted to be carried off company premises.

Should James wish to send the report electronically over XYZ's networks, the communications server in the network at the laboratory will recognize the security flag and encrypt the data before sending it through telecommunications circuits outside company premises.

Finally, James locks the report in a cabinet with a bar and padlock.

This example reflects actual information policies used by highly successful companies in competitive businesses.

If you have never used an information classification system, you may be saying to yourself, "What a lot of bother!" A word to the wise: Many companies have been financially ruined upon discovering they had no redress in court by which they could recover stolen information. They too thought protection was too much bother.

Paul Thomas is the controller for XYZ. Most of the financial reports and analyses he deals with are company-classified at the middle level, or XYZ Restricted. Reports are locked in desks when not in use or when the user is away from his workstation for more than an hour.

When a systems consultant is hired to develop analytical tools for microcomputers, Thomas makes sure the consultant has signed a disclosure agreement to protect XYZ in the event the consultant gains access to confidential information.

> MANY companies have been financially ruined upon discovering they had no redress in court by which they could recover stolen information.

Thomas regularly checks his subordinates' information handling practices and frequently walks through copy rooms after working hours to check for documents left behind. (The worst exposure comes from copies of documents inadvertently left in copiers by employees and picked up by maintenance workers or casual passersby.)

Thomas also insists that all sensitive accounting reports be clearly marked with the XYZ Restricted logo. His interest in securing information has made the accounting department an example to other areas of the company. Accounting employees know that information is not to be shared with other employees unless the person has a need to know.

Since the daily routine of work is almost always with the same set of people, this is not a big problem. Requests for information from outside the working group must be approved by Thomas.

Management dream

XYZ is a shining, if imaginary, example of well-managed information. The firm's employees made classification decisions with learned judgment based on knowledge of the purposes and methods of the company's classification scheme. XYZ's workers acted promptly and consistently and were alert to possible security breaches.

Morever, every employee (perhaps with the exception of production workers) was required to understand the purpose and methods involved.

Correct classification of company information, resulting in the proper security, is needed if we are to provide quality information for business purposes. ●

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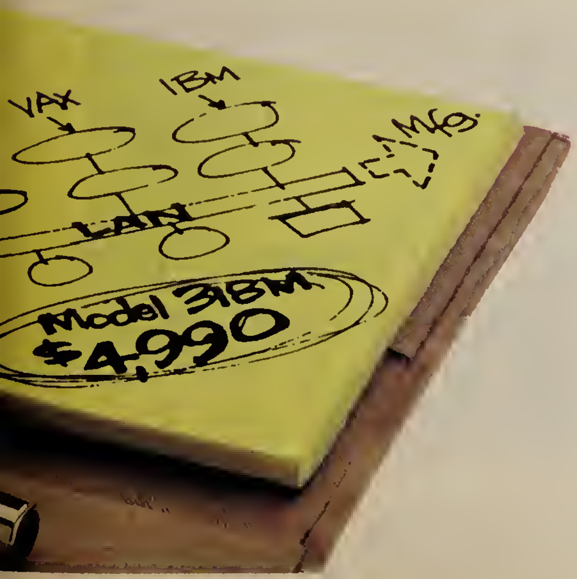

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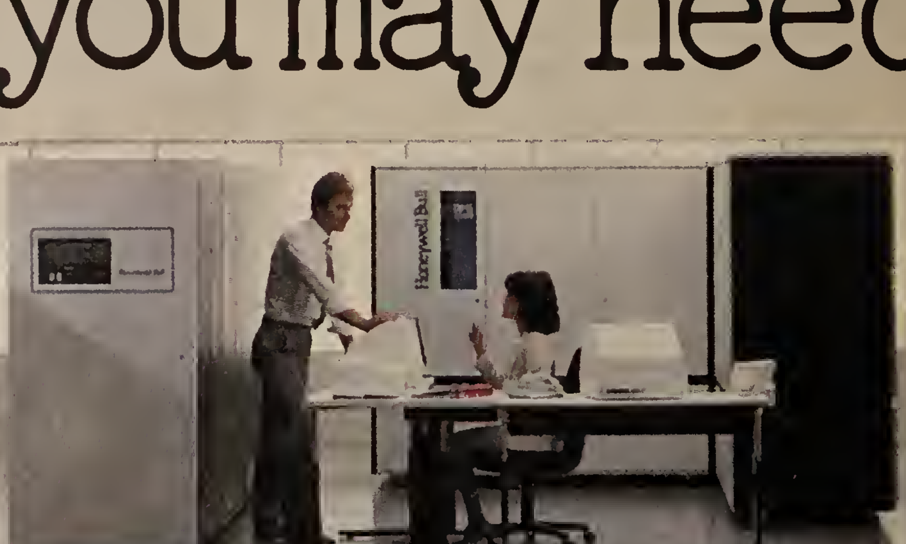

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TAKING CHARGE

David Ludlum

Keep close to the customer

The contemporary cause of applying information technology in order to further corporate strategies sometimes illustrates one of the oldest business maxims: The customer is always right.

Some recent conversations with executives responsible for strategic applications of information systems illustrate this. The executives noted that their concepts started with the goals of getting closer to customers or examining customers' needs.

This underlies the more current maxim that forward-looking information systems managers must think more like businessmen than technologists.

A few years ago, information systems managers at Levi Strauss in San Francisco decided the clothing manufacturer needed closer ties to the retailers that are its customers. The managers formed a committee that spent almost a year talking to retailers about what they wanted, according to Bill Eaton, vice-president for information systems at Levi Strauss.

The talks resulted in Levilink, a host-to-host information service run by third parties. By providing Levi Strauss with access to retailers' point-of-sale data and allowing retailers to place orders for clothing electronically, the system helps Levi Strauss attune its production to the latest sales trends.

Continued on page 89

Chase nurtures global data center grapevine

BY PATRICIA KEEFE
CW STAFF

NEW YORK — Decentralization does not have to mean isolation. An innovative program under way at The Chase Manhattan Bank NA suggests you can have your cake and eat it, too.

As it approaches its third year of operation, Chase's Data Center Management Program (DCMP) is providing 90 dedicated data centers around the world with peer support, consistency and a sense of community. While credited with saving Chase at least $13 million in the last two years, it costs just $500,000 annually to support.

"Not a bad return on investment," says George Orwicz, program manager and vice-president.

Formally launched in May 1985 at the behest of Elaine Bond, Chase's senior vice-president of corporate systems, the DCMP lets data centers share information, resources and solutions. It also bridges the MIS community to other Chase organizations. Chase spends more than $200 million annually to support the operations of its data centers, which employ about 1,700 people.

Each year, the DCMP assigns a representative to each of its three major hardware vendors: IBM, Wang Laboratories, Inc. and Digital Equipment Corp. The representatives devise programs to foster better understanding of the technology, better vendor relations and better communication between the centers and senior management.

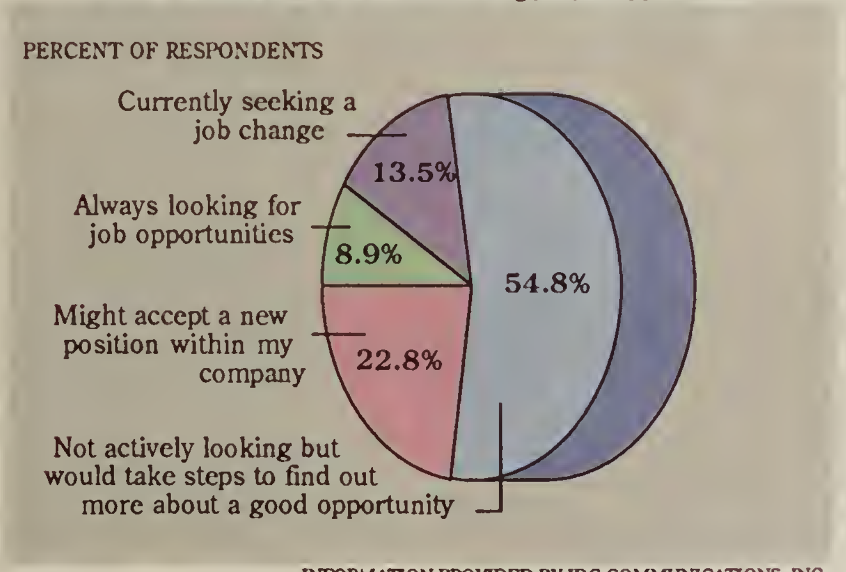
"Two years ago, two data center managers in the same building didn't even know each

Continued on page 91

Data View

Job hoppers

More than one-fifth of 615 respondents to a survey of Computerworld *readers described themselves as looking for job opportunities*



INFORMATION PROVIDED BY IDG COMMUNICATIONS, INC.
CW CHART

Picking the Mac

Big Eight exec went out on a limb with Apple

BY DOUGLAS BARNEY
CW STAFF

Like many people trained in accounting, Rick Richardson does not look like a gambler. But as national director of technology development and general partner at Arthur Young, Richardson is not afraid to take chances, even when the firm's entire microcomputing strategy is at stake.

And Richardson has won big. That is exactly what happened in late 1985, when he decided that Arthur Young's microcomputing platform would be the little-tried Macintosh from Apple Computer, Inc. Richardson began to evaluate the Macintosh before it was announced and has never looked back. At Arthur Young, Macintoshes outnumber Microsoft Corp. MS-DOS machines by a 15-to-1 ratio.

Richardson pushed for the Macintosh because of its ease of use and common interface.

"MS-DOS was not easily accepted by everyone in the firm," he explains. But while the Macintosh had been adopted by rival Big Eight accounting firm Peat, Marwick, Main & Co., others at Arthur Young, along with one of its clients, questioned the move to the Macintosh.

'Trotting off the path'

"There was a fair amount of discussion that said, 'IBM rules the world, we are bucking the tide,' and so on. There was a tremendous concern that we may be trotting off the path," Richardson says. But, armed with facts about training costs and the ability of the Macintosh to connect to other systems, Richardson won the battle.

Carl D. Liggio, Arthur Young's general counsel, notes that the Macintosh has brought the firm significant savings in training costs. "We hire 900 people a year, and they have to become proficient in this technology," Liggio says. "You're talking about costs that become unbearable over the long haul."

Richard Young, a regional managing partner and vice-chairman of Arthur Young, recalls that Richardson followed Apple closely in opting for the Macintosh. "He recognized the power that the Macintosh had and that Apple would be able to come out with continually better products," Young says. While acknowledging Richardson's imagination and innovation, Young also stresses that he is accessible to users and aims for practical applications.

"He is the right guy to be in a technical position because he listens well and can take something

Continued on page 89

PROFILE

Rick Richardson

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JAN. 24-30

Conference on Interactive Videodisk Systems. Clearwater, Fla., Jan. 24-26 — Contact: Institute for Graphic Communication, Inc., 375 Commonwealth Ave., Boston, Mass. 02115.

The Desktop Communications Conference. Anaheim, Calif., Jan. 25-27 — Contact: Desktop Communications Conference, Infonetics, Inc., Suite 100, 3235 Kifer Road, Santa Clara, Calif. 95051.

Measuring Quality and Productivity in a Data Processing Environment. Orlando, Fla., Jan. 25-27 — Contact: Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla. 32819.

Communications Networks '88. Washington, D.C., Jan. 25-28 — Contact: IDG Conference Management Group, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

Florida Instructional Computing Conference. Kissimmee, Fla., Jan. 25-28 — Contact: McRae and Co., P.O. Box 12187, Tallahassee, Fla. 32317.

Second Annual Conference on Improving Productivity In EDP System Development. Tuscon, Ariz., Jan. 25-29 — Contact: Applied Computer Research, Inc., P.O. Box 9280, Phoenix, Ariz. 85068.

DB2/SQL Users Group Meeting. New York, Jan. 26 — Contact: DB2/SQL Users Bulletin, Box 560, Wall Street Station, New York, N.Y. 10005.

American Bankers Association 1988 National Security and Risk Management Conference. Orlando, Fla., Jan. 26-29 — Contact: Ed Alwood, ABA, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

JAN. 31-FEB. 6

Financial Investment Management Exposition & Conference. Los Angeles, Feb. 2-3 — Contact: FIM-West, P.O. Box 4440, New York, N.Y. 10163.

Society For Computer Simulation Multiconference. San Diego, Feb. 3-5 — Contact: SCS, P.O. Box 17900, San Diego, Calif. 92117.

EDI — One on One. Chicago, Feb. 4 — Contact: Automotive Industry Action Group, Suite 830, 17117 W. Nine Mile Road, Southfield, Mich. 48075.

Strategic Planning for New Technologies: The Role of the Planner In the 1990s. Chicago, Feb. 5 — Contact: Aida Rivera, Executive Programs, 1221 Avenue of the Americas, New York, N.Y. 10020.

FEB. 7-13

Building on Effective Standards Program. Orlando, Fla., Feb. 8-10 — Contact: Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla. 32819.

International Conference on Computers and Law. Santa Monica, Calif., Feb. 8-10 — Contact: Michael Krieger, ICCL 88, P.O. Box 24619, Los Angeles, Calif. 90024.

Focus on Operations-VIII: Profile of the Professional. Las Vegas, Feb. 8-11 — Contact: International Association for Computer Operations Managers, 742 E. Chapman Ave., Orange, Calif. 92666.

Uniforum 1988. Dallas, Feb. 8-11 — Contact: Uniforum 1988, Suite 205, 2400 E. Devon Ave., Des Plaines, Ill. 60018.

Data Storage Interface Week. San Jose, Calif., Feb. 8-12 — Contact: Technology Forums, Suite 260, 80 W. 78th St., Chanhassen, Minn. 55317.

CAP '88 Conference and Exhibition on Desktop and Workstation Publishing Systems. Washington, D.C., Feb. 9-11 — Contact: Computer Aided Publishing, 90 W. Montgomery Ave., Rockville, Md. 20850.

Usenix Technical Conference. Dallas, Feb. 9-12 — Contact: Usenix Conference Office, P.O. Box 385, 16951 Pacific Coast Highway, Sunset Beach, Calif. 90742.

Second Conference on Applied Natural Language Processing. Austin, Texas, Feb. 9-12 — Contact: Donald Walker, Bell Communications Research Corp., MRE 2A379, 445 South St., Morristown, N.J. 07960.

Interex Computing Management Symposium. Anaheim, Calif., Feb. 10-13 — Contact: Interex Conference Department, 680 Almanor Ave., Sunnyvale, Calif. 94086.

FEB. 14-20

Executive Briefings on Automatic Identification. Cleveland, Feb. 16 — Contact: Automotive Industry Action Group, Suite 830, 17117 W. Nine Mile Road, Southfield, Mich. 48075.

Dexpo East 88, The 14th DEC-Compatible Exposition & Conference. New York, Feb. 16-18 — Contact: Susan Werlinich, Expoconsul International, Inc., 3 Independence Way, Princeton, N.J. 08540.

Resocom '88. Paris, Feb. 16-19 — Contact: IDG Conference Management Group, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

Auto Ideas. Atlanta, Feb. 17-18. Contact: Automotive Industry Action Group, Suite 830, 17117 W. Nine Mile Road, Southfield, Mich. 48075.

FEB. 21-27

Supercomputing Europe '89. Utrecht, The Netherlands, Feb. 21-23 — Contact: Royal Netherlands Industries Fair, Postbus 8500-3503 RM Utrecht, The Netherlands.

11th Annual Personal Computing Forum. Naples, Fla., Feb. 21-24 — Contact: Sylvia Franklin, Edventure Holdings, 375 Park Ave., New York, N.Y. 10152.

The Fifth Annual Electronic Printing Systems Conference. San Jose, Calif., Feb. 21-25 — Contact: S. Thomas Dunn, EPS

Continued on page 88

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LOCAL HAPPENINGS

NORTHEAST

Bangor, Maine, Jan. 20. Data Processing Management Association (DPMA), Maine Pine Tree Chapter. Leadership Qualities, with former Gov. Ken Curtis. The Bangor Hilton. 5 p.m. Contact: J. Fieweger, Delta Chemicals, Inc., Searsport, Maine 04974.

New York, Jan. 20. DPMA, New York Chapter. Reviewing Controls in Automated Security Systems. Beekman Restaurant, 15 Beekman St. 5 p.m. Contact: Mary Vogt, 455 E. 83 St., New York, N.Y. 10028.

Boston, Jan. 21. Society for Information Management (SIM), Boston Chapter. Reengineering: The Solution to Maintenance, Enhancement and Migration, with Charlie Bachman. Anthony's Pier 4. 11:40 a.m. Contact: SIM, P.O. Box 116, Newton Lower Falls, Mass. 02162.

Hunt Valley, Md., Jan. 26. Association for Systems Management (ASM), Baltimore Chapter. The Next Generation of Computer Workstations, with Ronald Weissman of the University of Maryland. Marriott Hunt Valley Inn. 6 p.m. Contact: Eileen Souza, 1904 Brightwood Court, Eldersburg, Md. 21784.

SOUTHEAST

Richmond, Va., Jan. 26. ASM, Richmond Chapter. Data Center Automation or Operatorless Computers, with Will Devries of Parnassus, Inc. Holiday Inn/Crossroads, 2000 Staples Mill Road. 5:30 p.m. Contact: Gary Morse, ASM, P.O. Box 32172, Richmond, Va. 23294.

Largo, Fla., Jan. 27. Tampa Bay Relational Technology User Group. Multiple Uses of DB2 at Local Companies. Paradyne Corp., 8550 Ulmerton Road. 8:30 a.m. Contact: Michael Rainger, P.O. Box 2826, Largo, Fla. 34292.

Essington, Pa., Feb. 5. Delaware Valley DB2 and SQL/DS Users Group. The Relational Model and its Implications, with Chris Date. 9:00 a.m. Ramada Inn. Contact: DB2 and SQL/DS Users Group, Suite 505, 3650 Silver Side Road, Wilmington Del. 19810.

MIDWEST

Cleveland, Jan. 27. DPMA, Cleveland Chapter. New Developments in Electronic Communications, with Fred R. Amport Jr. of Amport and Associates. Cleveland Hilton South, Rockside Road and I-77. 6:30 p.m. Contact: Nina Perkins, Comsol Corp., 8969 Brecksville Road, Brecksville, Ohio 44141.

Columbus, Ohio, Jan. 27. ASM, Central Ohio Chapter. Children's Hospital's Use of Computers, with Malcolm Murray of Childern's Hospital; Systems Application Architecture, with Dick O'Connor of IBM. Fawcett Center for Tomorrow, 2400 Olentangy River Road. 5 p.m. Contact: Deborah Maccora, Columbus Southern Power Co., 215 N. Front St., Columbus, Ohio 43220.

Lafayette, Ind., Feb. 11. DPMA, Sagamore Chapter. Computing at Alcoa Laboratories, with Mike Purpura of Alcoa. 5:30 p.m. Contact: Joan Vaughan, Alcoa MIS department, Box 7500, Lafayette, Ind. 47902.

WEST

Santa Monica, Calif., Jan. 23. DPMA, Los Angeles Chapter. 1988 Installation Dinner Dance. The Chronicle Restaurant, 2640 Main St. 6 p.m. Contact: DPMA, P.O. Box 1047, Hollywood, Calif. 90078.

San Francisco, Feb. 3. Association for Women in Computing, Bay Area Chapter. Ethical and Controversial Issues in the Funding of Computer Science, with Barbara Simmons of the Association for Computing Machinery Committee on Scientific Freedom and Human Rights. The Faz Restaurant, 132 Bush St. 5:30 p.m. Contact: AWC, Suite 1044, 41 Sutter St., San Francisco, Calif. 94104.

Continued from page 86

'88 Conference Chairman, Suite 1, 1855 E. Vista Way, Vista, Calif. 92084.

Effective Methods for Data Processing Quality Assurance. Orlando, Fla., Feb. 22-24 — Contact: Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla. 32819.

Fourth Annual Computer Graphics New York. New York, Feb. 22-24 — Contact: David J. Small, Exhibition Marketing & Management Co., Suite 1110, 8300 Greensboro Drive, McLean, Va. 22102.

Vision Guidance For Robotic Systems. Cincinnati, Feb. 23-25 — Contact: Joanne Rogers, Special Programs, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Super Graphic Workstations. Monterey, Calif., Feb. 23-25 — Contact: Institute for Graphic Communication, Inc. 375 Commonwealth Ave., Boston, Mass. 02115.

Interactive Instruction Delivery/Learning Technology in the Health Care Sciences. Kissimmee, Fla., Feb. 24-26 — Contact: Society for Applied Learning Technology, 50 Culpeper St., Warrenton, Va. 22186.

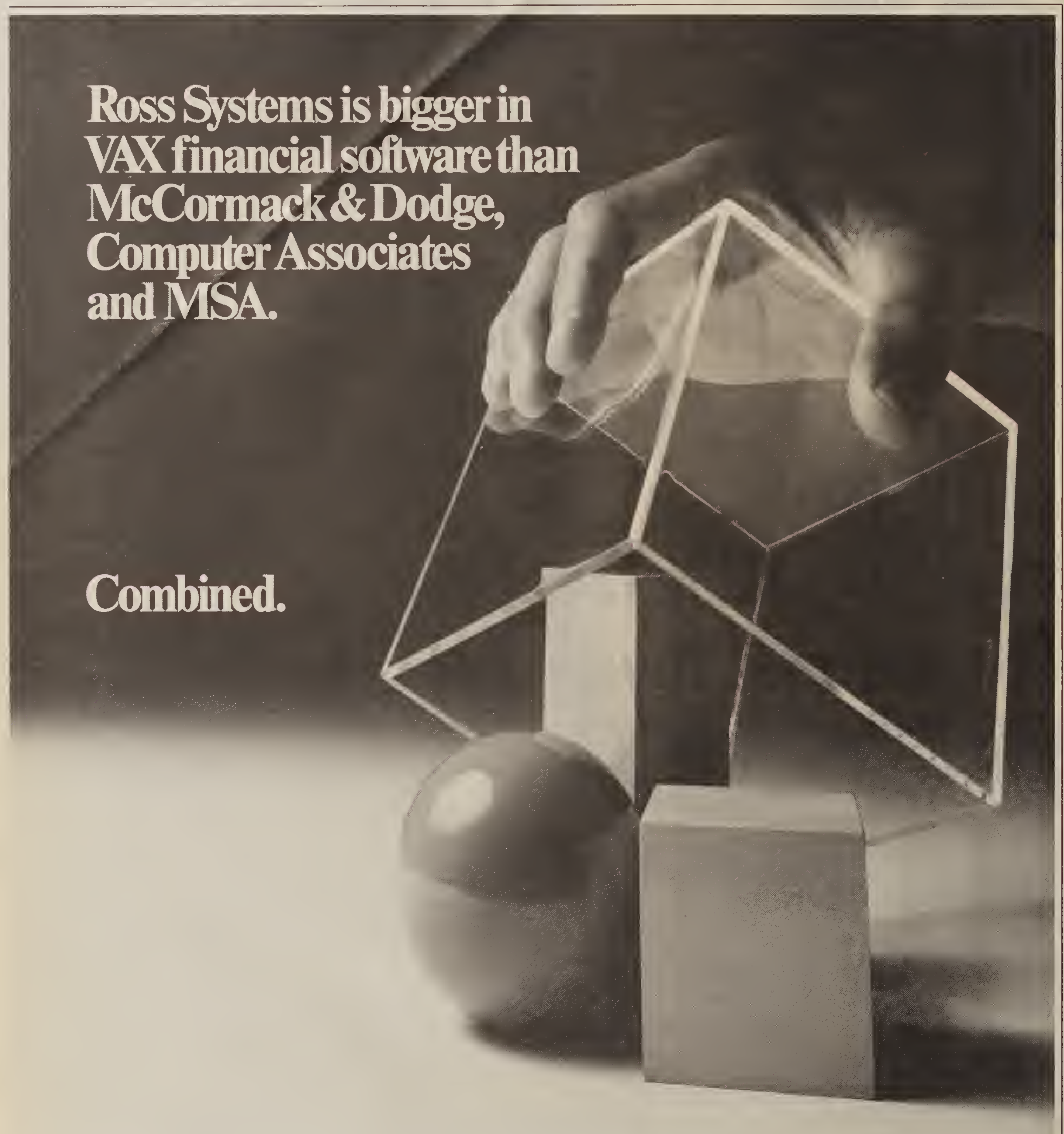
FEB. 28-MARCH 5

Telecom '88 Bank Telecommunications Conference. Bal Harbour, Fla., Feb. 28-March 2 — Contact: Ed Alwood, American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

Third International Conference on CD ROM. Seattle, March 1-3 — Contact: Sherrie Eastman, Microsoft Corp., Box 97017, 16011 N.E. 36th Way, Redmond, Wash. 98073.

MARCH 6-12

2nd IEEE Conference on Computer Workstations. Santa Clara, Calif., March 7-10 — Contact: Computer Society of the IEEE, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.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Ludlum

CONTINUED FROM PAGE 85

An urge to get closer to customers, along with technological developments, led New York Life Insurance to undertake Project Steer, a $150 million effort to overhaul its information systems architecture, according to Michael J. McLaughlin, the company's senior vice-president for information systems and services.

Along with the recognition of the evolution of data base technology, the Project Steer concept arose from the perception of a need to deal with customers as individuals. The project emerged with the central theme that the company direct its processing from a policy-number orientation to a customer orientation.

The concept of keeping close to the customer is also touted by Michael R. Zucchini, executive vice-president and chief information officer at Fleet Financial Group in Providence, R.I. Previously, Zucchini led the development effort of the Confer system at General Re Corp., a reinsurance firm in Stamford, Conn.

The business process

Zucchini says understanding the underlying business process is the most important requirement for developing a strategic system like Confer.

Confer allows General Re customers to use a terminal in their office to get quotations for reinsurance policies, the policies themselves, accounting and billing data and information on policies they hold.

Understanding the business process has to go far beyond what's possible by talking to colleagues within one's company, according to Zucchini. One has to have an understanding of how a customer perceives the products.

Being on the lookout for opportunities to automate, Zucchini launched Confer after speaking with General Re customers, who said the company could help them by making data on their policies available to them. Before Confer, customers who wondered whether they held reinsurance for an insurance policy often conducted an error-prone search of paper files in a warehouse.

Developing Confer took three years and differed from more conventional projects in that MIS employees had to work more closely with marketing professionals.

At that point, interpersonal skills became highly desirable, according to Zucchini. Technical people involved in the project had to develop a good rapport with the General Re marketing staff, which, understandably, is always concerned about protecting the customers.

This situation also underscores the importance of forward-looking information systems managers emulating general business executives.

Ludlum is *Computerworld's* senior editor, management.

Picking the Mac

CONTINUED FROM PAGE 85

explained as a need and adapt it into a specific application," Young says. "That's a talent not a lot of people have."

Young also says Richardson does not give up easily. "When he has an idea, he is a champion for that idea," Young says.

Richardson, who joined Arthur Young as an auditor before moving onto computer auditing, has a higher profile than most information managers. A recent trip to Microsoft in Seattle is a case in point. While most users would be content with a day-long briefing by product managers, Richardson met with Chairman Bill Gates, discussing and debating in which direction technology such as compact disk/read-only memory is heading.

'More than a casual user'

Indeed, Richardson's job involves consulting numerous vendors, many of which are Arthur Young clients, about product research and design. "I'm more than a casual user, I guess," he says.

For relaxation, Richardson, 43, plays the drums and the organ, delving into "almost everything but opera," particularly big band tunes. He is also an avid photographer, with a darkroom and a gallery at his New Canaan, Conn., home.

Despite his busy work schedule, colleagues describe Richardson as calm and jovial. They say he motivates his staff of 21 by demonstrating the importance of a task and providing an atmosphere in which creativity is encouraged.

"Trying to get a bunch of lawyers to use computers is not the easiest thing in the world," Liggio says, adding that he still goes to Richardson for help. "He is my guru when I am looking at innovative ways of using the computer as a management tool in dealing with litigation," Liggio adds.

And Richardson is not finished automating the legal department. "Assuming all goes well, I will have nothing but a Mac environment," Liggio says.

Richardson, who is friends with author and futurist Alvin Toffler, says some of the vision driving his group's work during 1983 and 1984 was directly inspired by Toffler's book, *The Third Wave.*

Richardson admits to being a bit of a futurist himself. "I spend a lot of time saying, 'Wouldn't it be nice if we could . . .' " But like a poker player holding his cards close to his chest, he declines to comment on inspirations for future initiatives. "We face strong competition in this business," he says.

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Upcoming SPOTLIGHT Issues

Issue	Topic	Ad Closing Date
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March 14	DBMS	Feb. 26
March 28	Micro-to-Host-Links	March 11
April 11	PCs (IBM-Compatible) Portables/Laptops	March 28
April 25	TBA	April 8
May 9	Printers	April 22
May 23	Data Communications	May 6
June 6	CASE	May 20
June 20	The SNA Market	June 3
July 11	Disaster Prevention & Recovery Products & Services	June 24
July 25	Productivity Software	July 8

Chase

CONTINUED FROM PAGE 85

other," Orwicz says. "When we started, we didn't know how many [data centers] we had or where they were," adds Vincent Tomasulo, a vice-president in charge of the Corporate Controller's data center.

Today, 90 data centers are working together in the following ways:

- Conducting biannual self-assessments in which centers measure themselves against preset Chase standards.
- Holding peer site reviews through committees composed of managers who identify key issues related to data center management and suggest remedies.
- Cutting costs through centralized bidding and equipment swap lists, thus reaping substantial savings.

Also provided are monthly meetings given by the three hardware groups on career development as well as guidelines for acquisition strategies.

Peer reviews pump program

The heart of the program — peer reviews — are not audits. They let data center staffs make internal contacts and share expertise, primarily management skills. A key benefit is exposure to different methods of approaching the same problems.

Standard operating procedures are set by the DCMP, but they can spring from individual data center managers. "We consolidate these ideas. If we see something interesting being developed in one place, we will promote it across the board," Orwicz says.

Using a standardized Peer Review Guide and led by a coordinator from the DCMP office, the review team typically spends a week examining how the data center is organized, managed and controlled, Orwicz says. Areas covered include human resources, financial issues, technology, environment, risk exposure, planning and control and user relations.

The review provides qualitative analysis and recommendations. After the review site responds, a follow-up visit is conducted.

Familiarity tends to breed relevant advice, according to the manager of a Hong Kong data center, who says he finds it comforting to work with people who understand the issues he faces and can address them. To date, more than 35 reviews have been conducted, involving about 100 reviewers.

Financial savings have been significant, the bank claims. The centers now provide monthly forecasts on equipment needs, letting Chase's Contracts Administration Group negotiate volume discounts, Tomasulo says. In the last two years, Chase has saved more than $12 million in equipment costs using volume procurements. During a recent negotiation, Chase saved $18,000, according to Orwicz.

The DCMP's newsletter publishes a "blue list" of hardware available within the Chase community. This has facilitated equipment swapping between sites, saving more than $950,000 in the last 18 months. There are plans to put a more detailed version of this list into an on-line data base, an effort that will likely take a few years, Orwicz says.

Outside the data centers, the program is being used as a model for other groups within Chase as a way of coalescing the power of the community toward common goals, according to Tomasulo.

Orwicz, in foreground, *with fellow members of the DCMP peer review team.*

Future plans include broadening peer reviews to include Chase's systems community, networking the data centers and instituting capacity management. The DCMP initiated the idea to network the data centers, although a separate group will execute the project. The foreseeable benefits include sharing applications and resources, contingency planning and elimination of manual tape delivery.

The DCMP is currently developing a set of guidelines for capacity planning as well as a special review dealing specifically with this area. "Our peer reviews are becoming more diversified," Orwicz says.

The DCMP serves as a catalyst, Orwicz says. "We use the resources that we can find throughout the community and form task forces. They, in turn, work on specific projects that benefit the whole community," he says.

In doing so, the project has demonstrated to users the importance of the data center to the business while stimulating support from upper management.

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"We're advertising all our services to numerous diverse groups. And we're reaching them all through Computerworld."

— Crista Martyr
Senior VP/General Manager
Leasametric Data Communications

Realistically, Leasametric Data Communications of Foster City, California, is many companies rolled into one. Along with being a major equipment-rental company, the 25-year-old Leasametric also leases, maintains and sells personal computers, peripherals and networks.

With so much going on in one place, it's no surprise that Senior Vice President/General Manager Crista Martyr has a lot to think about. Not the least of which is advertising.

"We're out to reach a broad base of customers in Fortune 1000 businesses. Over the last year we set out to position the company as a long-established survivor — and the perfect choice for one-stop shopping.

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COMPUTERWORLD

IBM revs up 3090s — with a hitch

INSIDE

In Depth: Price Waterhouse expects more from microcomputers. 53

Spotlight: New tools

Lack of advance notice riles users

BY JEAN S. BOZMAN
CW STAFF

relationships with IBM. Some of these firms were among the earliest to install the IBM 3090 Models 200 and 400. They learned that their machines would have to be upgraded to higher E models in order to gain the new performance features.

Rolls out biggest mainframe ever

BY STANLEY GIBSON
CW STAFF

RYE BROOK, N.Y. — IBM last week replaced its 3090 mainframes with a new line of

cessing units, and the Model 300E has three CPUs. Both computers will be available in the third quarter of this year.

COMPUTER INDUSTRY

INDUSTRY INSIGHT

Clinton Wilder

High-tech hype strikes

In California, they're blaming the lack of a showcase-clean room and not enough direct participation by the governor. In Massachusetts, in the midst of the coldest winter in years, they're blaming — what else? — the weather.

But down in Texas, they're hailing it as the greatest thing for civic pride since the oil boom days of bumper stickers that said "Freeze a Yankee" and "Last person leaving Michigan please turn out the lights."

All the hype and hand-wringing is for Sematech, the U.S. semiconductor industry's embryonic manufacturing consortium, and its choice of Austin as home. The bidding and wooing war had all the regional one-upmanship of a college basketball championship — with a few extra goodies, like the presidential hopes of Bay State Gov. Michael "Massachusetts Miracle" Dukakis, thrown in.

Clearly, despite the staggering downturn of the semiconductor business a couple of years ago, high tech is still in high fashion among the nation's chambers of commerce. And the three finalists in this recently concluded contest all want to claim

Continued on page 95

Investors: High-tech health robust

Venture capitalists embrace industry; seen as good bet in shaky economy

BY NELL MARGOLIS
CW STAFF

Forget Gorbachev. If the venture capital community crowns a man of the year, 1988 honors are likely to go to the late Charles Darwin.

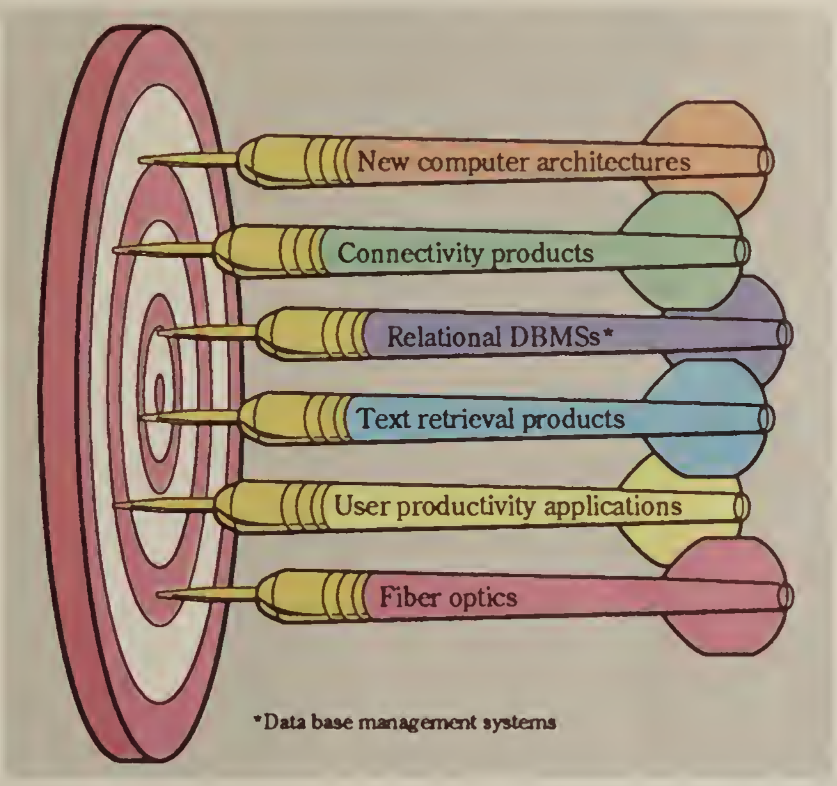
Survival of the fittest is the name of the game in the post-stock market crash entrepreneurial sector. Prominent venture capitalists say that high-technology companies, particularly those offering new systems architectures and software solutions geared toward increasing productivity, are well positioned to prevail.

Immediately after the Oct. 19 stock debacle, the outlook for high technology seemed bleak. According to Charles Federman, a partner in Broadview Associates, a mergers and acquisitions firm in Fort Lee, N.J., "after the 34.1% drop in information technology sector stocks — a deeper dip than the market took overall — the public market is dead."

Venture capital, however, is anything but dead. Estimates compiled by Venture Economics, Inc., a market research firm in Wellesley, Mass., show a record annual amount of investment dollars raised by independent private venture capital partnerships in 1987, with the majority closing in the second half of the year and much of that after Oct. 19. Final figures, to be released next month, are expected to show an all-time high in disbursements as well.

On target

Computer technologies expected to score high in venture capital funding in 1988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Relational DBMSs*
Text retrieval products
User productivity applications
Fiber optics
*Data base management systems

CW CHART: FRANK C. O'CONNELL

A new year of plenty

Moreover, the industry as a whole headed into 1988 with a hefty $1 billion in inventory, according to Stevan A. Birnbaum, general partner of Santa Monica, Calif.-based Oxford Partners. "There's plenty of money out there," he said.

And plenty is likely to be targeted at high-tech companies. Computers and software packages hold the promise of streamlined business practices and increased quality control — in short, competitive advantages that take on heightened, not diminished, importance during shaky economies, said Howard Wolfe, a partner at Baltimore-based New Enterprise Associates.

"I think 1988 is going to be a good year for technology overall," said Jack Carsten, general partner at U.S. Venture Partners in Menlo Park, Calif. Carsten, who joined the ranks of venture capitalists this month after a distinguished 25-year career in the semiconductor industry, placed much of his optimism on an increasingly strong inter-

Continued on page 94

Brazil heeds U.S. warnings

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Brazil's government appears to be softening the protectionist trade policies that have so angered the U.S. computer industry, but the U.S. drive toward trade sanctions continues.

The Reagan administration is expected to announce sometime this month a list of Brazilian products that will be hit with 100% punitive import tariffs. The action will retaliate against Brazil's Informatics policy, which protects its domestic hardware and software industries from foreign competition.

The U.S. government specifically charged that Brazil's Secretariat for Informatics unfairly blocked Microsoft Corp. from distributing its MS-DOS software in Brazil [CW, Nov. 30, 1987].

From the perspective of the U.S. computer industry, there have been some favorable developments in Brazil since the U.S. sanctions were proposed in November 1987, according to the Computer and Business Equipment Manufacturers Association (CBEMA).

Last month, Jose Sarney, president of Brazil, approved legislation that provides copyright protection for software. In the process, he deleted a provision that would have imposed a

Continued on page 95

Turnaround ace Cavalier reshuffles deck at Britton Lee

BY STEPHEN JONES
CW STAFF

LOS GATOS, Calif. — Corporate turnarounds are nothing new for John C. Cavalier, but his greatest challenge could be awaiting him as the new president and chief executive officer of troubled Britton Lee, Inc.

The manufacturer of shared relational data base systems has been in a tailspin for the last two years. Profits have nosedived into the red, product introductions have been consistently delayed and the company has failed to market its technology to a broad base of users.

Britton Lee's woes are evident in its earnings report for the 1987 fiscal year. The company expects to post a loss of about $10 million on sales of nearly $26 million for the year ended last month. Don Sinsabaugh, managing director of Swergold Chefitz & Sinsabaugh, Inc. in New York, estimated that earnings for the year will amount to a loss of $1.10 per share.

But Cavalier is trying to put the woes of the past behind him and the company. In the last two months, he has reorganized Britton Lee in an attempt to cut costs and return to profitability. Changes include the following:

- Ousting the company's two founders, David L. Britton and Geoffrey Lee, from the board of directors and having them cut all ties to Britton Lee's operation.
- Reducing the work force by 20%, or about 50 employees, from every level of the company.
- Cutting out a layer of management, including vice-president of sales and marketing Skid Pirtle.
- Shuffling the responsibilities and positions of half of the company's 15 top managers.

John C. Cavalier

"It was time for new management, and we realized that we would be better off to run the company with the strategy that we had developed over the last 60 days," Cavalier said. "What was lacking in the company was a consistent strategic direction."

Cavalier built a reputation as a turnaround expert at Santa Clara, Calif.-based NCA Corp. When he stepped in, the systems software vendor had had seven straight quarters of losses. By the time NCA was sold last year, its market value had jumped from $10 million to $44 million.

Cavalier claimed the changes at Britton Lee will pave the way for his plan to cozy up to technological partners and market the company's integrated hardware and software data base machines to Fortune 1,000 companies.

Analysts said a weak point for the company has been a poorly managed sales staff that could not keep up with the anticipated growth of the company. Britton Lee currentiy has an installed base of 800 data base machines tied to 1,200 multiuser host systems. Customers include AT&T, Ford Motor Co., Du Pont Co. and Mobil Corp. If the company hopes to hold on to those customers and attract others, Sinsabaugh said, it will have to start delivering new products.

"The computer industry is a new product industry, and they just haven't cranked out enough new products. But the company is a fighter, and they still have a good chance of making it," Sinsabaugh said.

High-tech health

CONTINUED FROM PAGE 93

national high-tech market. "We are only beginning to realize the strength of the international currency shifts."

While the crash neither cut off nor diverted the flow of venture dollars from technology, Birnbaum said, it did change certain equations for venture capitalists — equations that, in turn, will affect their investments. "Because we can't count on taking companies public in the near future, we'll have to give up larger shares to get smaller returns," he said.

Thus, there will be a premium on companies with experienced, proven management teams as well as track records for efficiency and distinctive products for which there is perceived market demand. "It is not a great strategy right now to lose money and assume you can raise venture capital," Birnbaum noted.

Being able to show relatively low cash requirements for the next several years will help firms looking for venture financing this year, said John Savage, general partner of Weiss, Peck & Greer Investments, a San Francisco-based venture capital firm with approximately $160 million under management. This factor could benefit software companies — whose emphasis on minds over metal ranks them among the least capital-intensive of businesses — over hardware companies, he noted.

"Software is more likely than hardware to provide uniqueness, to give added value," said Richard Burnes, general partner of Charles River Ventures in Boston.

On the other hand, according to U.S. Venture Partners' Carsten, hardware offers a tangibility advantage. "Software tends to be a harder deal," he said. "The value of the product is often difficult to determine at an early stage, as is the status of competitors' products, as is how much additional capital you'll be required to put in. When you're funding a software company, you never really know when you're at the 50% mark."

Among the best bets in hardware are new architectures — for instance, reduced instruction set computing and other accelerators, Carsten added.

Telecom hot

"Telecommunications is an area we're very interested in," said Jon Bayless, a partner in Dallas-based Sevin Rosen Management Co., which recently announced a new $65 million fund for seed and start-up investments in medical and high-tech companies. "There's going to be continued tremendous growth in this area, based on the transition to fiber optics and the rise of networking."

Also strong — Wall Street notwithstanding — is the business world's hunger for information: more of it that is easier to get at and faster to disperse. Thus, text retrieval software and relational data base management systems — more so if they are distributed and oriented toward transaction processing — made their way onto several venture capitalists' watch lists, as did connectivity products.

"We're looking toward software applications that really do solve problems that users are facing," Bayless said. Sevin Rosen, for instance, has an investment in 4-year-old Landmark Graphics Corp. in Houston, which manufactures computer-aided oil exploration software that provides a means for oil explorers to cut costs and improve their success rates. These efficiencies often mean the difference between survival and extinction in the beleaguered oil and gas industry.

"What builds companies is applications, not technology," said Stanley Pratt, general partner of Wellesley, Mass.-based Abbott Capital Management, Inc., an investment advisory firm with a fund of $320 million to invest in professional venture capital firms. "Productivity increase is the No. 1 factor behind venture capital investments. The question to ask is, How much more productive will the end user be if this company's product comes to market?"

EXECUTIVE CORNER

Unisys Corp. has elected **William L. Morgan** and **Albert F. Zettlemoyer** corporate vice-presidents.

Morgan will serve as vice-president and general manager of the Unisys Peripherals Group, which is headquartered in Santa Clara, Calif.

Zettlemoyer will serve as vice-president and general manager of the Computer Systems Division of Unisys's Defense Systems unit in Eagan, Minn.

Neil Davenport has been elected vice-president of Cray Research, Inc. Davenport began with the company in 1981 as managing director of Cray Research Ltd. in the UK, a position he will continue to hold.

Cray also elected **Edward Masi** vice-president of commercial marketing. Masi has been with Cray since 1980, serving as general manager of the company's U.S. eastern region.

Sevin Rosen Management Co. announced that **Ron Brittian**, formerly vice-president of corporate development and technology at Uccel Corp., has joined the company as a special limited partner. In this role, he will assist in the management of the new $65 million fund recently raised by Sevin Rosen for investment in high-technology companies at the seed and start-up phases.

Wilder

CONTINUED FROM PAGE 93

bragging rights as the U.S.'s high-tech capital.

Californians are miffed to see the industry that gave Silicon Valley its name choose to go elsewhere for this critical research project. Texans have been touchy about California on the technology front since Texas Instruments' Jack Kilby and Fairchild Semiconductor's Robert Noyce raced to invent the integrated circuit in the late 1950s. And Massachusetts is so image-conscious that it changed the Route 128 sign slogans from "America's Technology Highway" to "America's Technology Region."

The lavish public-sector courting was an ironic and enjoyable change for the semiconductor industry, which has spent the better part of three years tugging on the coattails of the federal government for protective and/or punitive measures against its Japanese competitors. That effort continues apace, as the Semiconductor Industry Association urged President Reagan last week to deny Japan's requests to ease trade sanctions. Sematech itself negotiated for months to win generous funding and cooperation from the U.S. Department of Defense.

Austin will no doubt enjoy several more months of hype, hoopla, self-congratulation and ribbon-cutting as Sematech settles into its new digs. But as the excitement subsides, harder questions will emerge.

> CLEARLY, despite the staggering downturn of the semiconductor business a couple of years ago, high tech is still in high fashion among the nation's chambers of commerce.

Can fiercely competitive semiconductor vendors truly work together to develop cooperative fabrication techniques? Will vendors send their top engineers to Sematech? And finally, will the consortium project truly meet its goal of improving U.S. competitiveness?

Skeptics can point to Austin's other highly touted research consortium, Microelectronics and Computer Technology Corp. (MCC) and doubt that the answers to the above questions would be positive.

Although MCC has succeeded in delivering technology advancements to its paying members, it has become better known for the exodus of some key members and its first chairman, retired Adm. Bobby Inman. MCC members and Austinites can credibly point to the consortium as positive, but it has not achieved the status of the computer industry's leading-edge research model that its founders had hoped.

To be fair, however, Sematech's charter is much more focused. Compared with MCC, the goal of improved, cost-effective chip production methods is more tangible and identifiable than the diverse research programs of MCC. And the semiconductor industry is more unified against its common enemy, Japan, than are its counterparts among computer vendors.

The ingredients for success are there, but in any cooperative effort among competitors, the formula is delicate. Although texans are not noted for restraint, "beware the high-tech hype" should be the appropriate watchword in the Lone Star State's capital as Sematech moves forward.

Wilder is *Computerworld's* senior editor, computer industry.

What ISDN is doing for McDonald's data networking capabilities is no small potatoes.

When McDonald's Corporation took a hard look at its telecommunications needs a few years ago, it saw 9400 restaurants in 46 countries, served by more than 20 networks. And a new restaurant opening every 17 hours.

McDonald's needed a telecommunications system that could grow with it, but one simple enough that the company could concentrate less on telecommunications and more on talking to customers.

The solution: the nation's first customer application of ISDN, the Integrated Services Digital Network, made possible by the cooperation of Ameritech's Illinois Bell and AT&T Network Systems.

McDonald's will use ISDN to send voice, data and video over ordinary telephone lines simultaneously. An AT&T 5ESS™ switch at Illinois Bell will support digital phones, integrated voice/data terminals, facsimile, voice mail, host access and modem pooling, giving McDonald's a real competitive advantage in its data networking capabilities.

"In business language, this means we're going to do an even better job for the 30 million customers that we serve every day," said Bonnie Kos, McDonald's Vice President of Facilities and Systems.

"ISDN provides an information outlet to every workstation, thereby eliminating time-consuming and costly wiring, as well as enhancing messaging and network control capability."

Thanks to ISDN, McDonald's will enjoy better customer service, more current market information, better tracking of product promotions, more efficient inventory control, and reduced administrative workloads.

Ultimately, higher level applications of ISDN on the public switched network will replace most of the company's myriad networks, linking all its offices and restaurants around the world.

As we are doing for McDonald's, AT&T and your telephone company can help your business realize the networking efficiencies and cost savings of ISDN.

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The right choice.

Brazil

CONTINUED FROM PAGE 93

tariff of up to 200% on imported software.

Furthermore, Brazil has appointed a government ombudsman to re-examine the Microsoft decision. The Brazilian press has reported that the ombudsman will make major changes in the decision, perhaps this month, according to CBEMA.

But CBEMA and other U.S. groups said the process toward imposing trade sanctions should continue until the Microsoft case and other trade disputes are resolved. The U.S. is also concerned about charges that a Brazilian company has pirated technology used in Apple Computer, Inc.'s Macintosh.

Move seen too late

A bulletin from the American Electronics Association suggested that Brazil's recent concessions will not be able to stop the U.S. sanctions. "The gesture appears to come too late. Attention [has shifted] to the broader issue of access to the entire computer market," the bulletin said.

Officials at CBEMA and ADAPSO, the computer software and services industry association, said it is especially important for the U.S. to push for free trade policies in Brazil because other developing countries look to Brazil as a trendsetter.

The U.S. proposed a ban on imports of Brazilian computer products and punitive tariffs on $105 million worth of other goods.

At a Dec. 18, 1987, hearing, CBEMA supported the imposition of tariffs but urged the government not to impose any sanctions that would harm the Brazil-based subsidiaries or affiliates of U.S. computer companies.

Dreaming about another career

Behind many professionals lurks a race car driver waiting to escape

BY JANET MASON
SPECIAL TO CW

As the new year gets under way, the thoughts of many MIS professionals turn to the promotions and new jobs that may lie ahead. But an inventive few also envision alternate careers.

Some denizens of the technical trade fantasize about becoming race car drivers or airline pilots, while others dream of running fast-food franchises or pioneering consulting firms.

For most professionals, these avocations will live only in their imaginations or become weekend hobbies. But a small number of dedicated dreamers intend to pursue their visions if and when they tire of their MIS jobs.

To foster new careers, some professionals intend to retire early. Others plan to incorporate the skills from their alternate backgrounds and hobbies into their MIS careers.

For example, if Jim Cataudella were a few years younger, he would be driving fast cars and mingling with Hollywood stars on the Indianapolis 500 racing circuit.

"I wouldn't give it a second thought. I'd walk right out of here without even saying I quit," he says. Instead, the systems programmer with Chase Manhattan Bank NA in New York only fantasizes about pursuing his Indy 500 hobby and concentrates on the more mundane matter of making the transition from a Wang Laboratories, Inc. computer to IBM equipment. Within five years, Cataudella expects to use the knowledge he gains in the IBM environment to work with an IBM network. In 10 years, his plans include managing a voice and data section of the company.

Cataudella's MIS experience combines with his interest in race cars to bring a new dimension to his passion. He is currently interested in the telecommunications and fiber-optics technologies that allow the pit crews at auto races to communicate with the drivers.

Right now, his interest is theoretical. "But who knows," he says, "someday that may be my break into the professional circuit."

Combining skills, careers

Some professionals, especially those who come from non-MIS backgrounds, find it easier to combine their technical skills with alternate careers.

Five years ago, Jane Mahorter left social work for a career in MIS. Now she is a systems analyst with the First Pennsylvania Bank NA in Philadelphia. But until six months ago, she still preferred psychology to systems development. At the time, her fantasy was to become a clinical psychologist.

> MANY MIS PROFESSIONALS judge their job satisfaction by how much fun they are having. They hope to maintain a freshness and enthusiasm for their work for the duration of their careers.

However, after reaching the five-year mark in MIS, Mahorter says she is much more comfortable with the field and would like to incorporate her social work skills and interest in people into her MIS job.

"I want to be somewhere where I keep growing and learning new things," Mahorter says. "Then I can start aiming myself toward a position where I can use my interest in people along with my computer skills."

Eventually, in five to 10 years, she hopes this combination will lead to a management position and then perhaps to her own consulting business.

Many MIS professionals judge their job satisfaction by how much fun they are having. They hope to maintain a freshness and enthusiasm for their work for the duration of their careers.

Enjoying work is the 10-year career goal of Elias Sagianis, technical support manager with AT&T in New York. "In 10 years, I hope to have the same level of fun that I'm having today — the same interest, challenge and fascination wherever I am," he says.

Sagianis manages a team of technical experts involved in identifying applications and providing solutions to problems. His goals are to advance further in management and work in a variety of jobs at AT&T, including direct sales.

"When my job stops being fun, I may pursue another career, such as starting a fast-food franchise," he says.

Early retirement popular

With more companies offering early retirement packages and people's health remaining sound into their later years, retiring early is becoming quite attractive for computer professionals seeking a change.

Michael Watson, a data base administrator for Rockville, Md.-based Computer Data Systems, Inc., dreams of becoming a commercial pilot. But during the next several years, he plans to learn more technical information to become a senior systems programmer.

Watson started flying airplanes 13 years ago after serving time in the U.S. Navy. That experience may incite him to retire early to pursue his hobby as a second career.

New job, same company

Some MIS professionals, such as senior systems analyst James Stanton, find that they can change careers without leaving their current employers.

Stanton, who holds a master's degree in public administration, works for the county government in the Minneapolis/St. Paul area. After going as far as he can in the county's MIS department, he plans to switch back to public administration — maybe in a combined administrative and MIS role.

In his spare time, Stanton develops microcomputer educational software. One of his efforts is a package on the market called If Reelected, which he hopes will take off this year. He has also taught computer classes and would like to teach again in the future. "It doesn't pay very much," he says, "but I hope to get to a point where money doesn't matter that much."

Mason is a Philadelphia-based freelance journalist.

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Must have BA Degree in Computer Science or Data Processing; 1 year experience with business Basic language; minimum of 3 years experience as programmer; minimum of 2 years management experience in a time share center; Background in "computer assisted instruction" operations and software; knowledge of time share hardware and operating software; and general knowledge of micro computers and available software. Must be willing to relocate. $36,000-$40,000 annually. To epply send letter of interest and resume to: Personnel Office, Central Arizona College, Woodruff/Overfield Road, Coolidge, AZ 85228. Position will remain open until filled. EOE.

Systems Engineer

Design, develop (using software tools), implement & test software for call processing on e server based distributed operating system for telecommunications. Position requires epplying concepts of parallel programming for distributed call processing software & related database for record keeping. Experience not required but must have a Master's degree in Computer Science. Requires a school project in implementing & testing a server based distributed operating system. Graduate study must heve included one course in Software Tools & one course in Parallel Programming. Salary offered $36,000 per/yr, 40 hrs per/wk, 8 A.M. to 5 P.M., M-F. Send required resume to Illinois Depertment of Employment Security, 401 South State Street - 3 South, Chicago, Illinois 60605. Att: Mrs. S. Chalem, Ref. #7598-S. An Employer Paid Ad.

Computer Softwere Engineer wanted to analyze complex systems; design, develop and implement distribution and manufacturing systems software for Burroughs small end large frame systems using COBOL, ALGOL, DMS II, GEMCOS, COMS end 4th Generation language LINC; Requires Bachelor's degree in Mechanical Engineering or Computer Science and two years experience in the job offered or two years related experience as e Computer Systems Analyst; $37,400.00 per year; 40 hours per week. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #73987 "Employer Paid Ad".

RESEARCH TRIANGLE OPPORTUNITIES

Currently recruiting experienced computer pros with background in any of the following: IBM Cobol mainframe applications; CICS; IDMS; IMS; ADABAS; Oracle; DB 2; VM/CMS; Financial, Mfg., Banking; Claims Processing; MSA; AMAPS; MVS, VM, NCP/VTAM, ACP or DEC/VAX Systems Progrs; Capacity Planners, Best-1, End-User Analysts; Database Analysts; S/38 RPGIII-/COBOL; DEC/VAX Mfg.; Tandem; Method 1; Spectrum 2; SDM; Pride. Partial listing of local, regional & nat'l fee paid positions. Call or write:

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Major University seeks Computer System Software Specialist to develop, modify, and assist with installation of computer software systems. Requires MS in Computer Science. Must have knowledge of IBM 4300 Series hardware stucture; IBM Operating Systems VM/CMS and DOS/VSE; computer languages REXX, FORTRAN, PL/1 and IBM assembly; Statistical package SAS and STSS. Contact, B. Jo Lyell.

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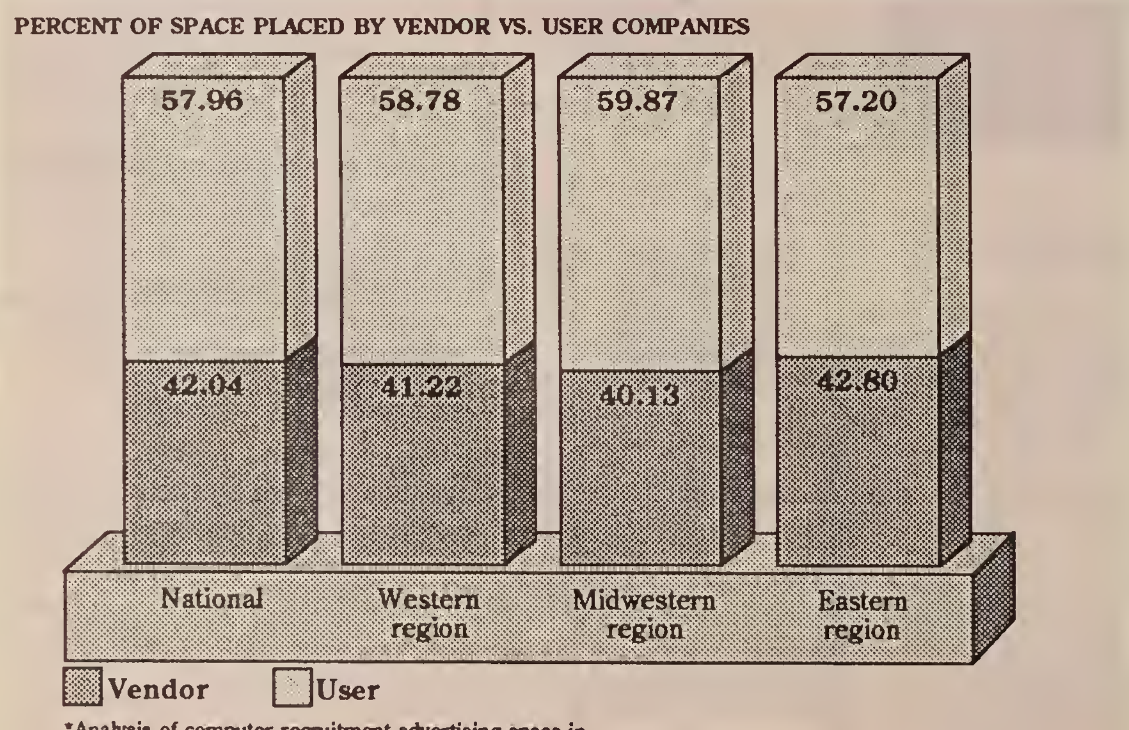
CAREER INDEX

November 1987 computer recruitment advertising activity*



*Analysis of computer recruitment advertising space in *Computerworld* and selected major U.S. newspapers

INFORMATION PROVIDED BY CW PUBLISHING, INC.'S RECRUITMENT MARKET RESEARCH DATA BASE

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Classified Advertising
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Hermann Hospital, located in the Houston, Texas Medical Center, has a growing Information Systems Department utilizing a large IBM mainframe and DOS/VSE operating system. We are currently seeking an Assistant Director of Information Systems.

In this position you would be responsible for Computer Operations, Technical Services and Applications Programming. The qualified candidate will have a minimum of 3-5 years of management experience in Information Systems. **You must possess experience with large IBM hardware preferably in a healthcare environment.** Knowledge of OS/MVS is a plus. A college degree is required and superb communications skills are necessary.

We offer an attractive compensation and benefits package. To apply, send your resume in confidence to: **Hermann Hospital, Texas Medical Center, J. Allard, Human Resources Department, 6411 Fannin, CW-118, Houston, Texas 77030.**

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data processing

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Suite 210
Omaha, NE 68154
402/333-2863

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Suite 430
Overland Park, KS 66210
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The ideal candidate will have the following qualifications:

- Project Management. Strong organizational and communication skills, plus the ability to manage projects to meet deadlines in a dynamic environment.
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- Software Development. Experience in design, development, and implementation of complex software systems.
- Human Relations. Proven success working in a team environment.

SPSS Inc. offers a competitive salary, comprehensive benefits, and a stimulating, state-of-the-art development environment in an attractive college town just south of the Minneapolis/St. Paul area.

For consideration, please send your resume along with salary history to:

Personnel Manager
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(3-6 yrs Fin. Apps)
MVS Systems Prog. . . . To $44K
3-5 yrs Gens Tuning)
CICS Systems Prog. . . To $45K
(3-5 yrs Maint/Debug)

NCP/VTAM Sys. Prog. . . . To $42K
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Sr. Sys. Analyst . . . . To $50K
(9-11 yrs CICS/COBOL)
CSP Prog. Analyst . . . . To $39K
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DB2 Prog. Analyst To $36K
(Min 3 yrs. Fin Apps.)
AMAPS Prog. Analyst . . . To $37K
(3-5 yrs Mfg Apps)

If you are sincere about a career move, it would be in **your** best interest to **exclusively** contact an agency that is well established, member of a national network, and will give your career interests top priority **Please send resume to Robert Montgomery.**

The Data Group
P.O. Box 52055, Raleigh, NC 27612

SYSTEMS PROGRAMMERS/ SOFTWARE ENGINEERS

For Los Angeles, CA Area

Strong BAL and or MVS, IMS, CICS, DB2 or VTAM INTERNALS experience desired.

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IDMS Database Analyst

Racal-Milgo is an international supplier of data communications equipment. The company develops, manufactures, markets and supports digital, analog and fiber optic products, including network management systems, data encryption devices, modems and multiplexers. We currently house both an Amdahl 5870 system and a Univac 1100/91 system. The Amdahl environment (MVS/XA) offers new development challenges.

To qualify for this position, you must have a BSCS and at least 3+ years of experience in database analysis which should include 2 years of IDMS ADS-O and database design. A technical support background would be a definite plus.

Our comprehensive compensation-benefits package includes medical/dental/life insurance, 3 weeks of paid vacation your first year, 401K savings plan and 100% paid tuition. Send your resume and recent salary history in confidence to: Keith Terrell, Sr. Employment Representative; **Racal-Milgo, Inc.**; P.O. Box 407044 (16798); Ft. Lauderdale, FL 33340-7044.

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data processing

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If your specialty is developing Decision Support Systems in a VM environment with an emphasis on fourth generation languages, Miller Brewing Company can bring out the best in you. Our large scale Information Center is a sophisticated, results-oriented environment charged with supporting one of America's largest and most progressive brewers.

You will have project leadership responsibilities in planning and conducting feasibility studies, and in systems analysis, design and development. You will also have key user training and support responsibilities.

A minimum of 2 plus years decision support system development experience in a VM environment is preferred. Knowledge of QMF with SQL/DS, FOCUS, SAS or DB2 desirable, with two or more years MVS/TSO experience. Superior organizational, problem solving, project management and technical training abilities are necessary. BSCS or equivalent preferred.

Miller Brewing Company is a subsidiary of the Fortune 50 Philip Morris Companies Incorporated. We offer competitive salary, complete benefits, and relocation assistance to the attractive, comfortable Milwaukee area. Send resume or letter to: Corporate Recruitment Manager, Dept. #1000-88, MILLER BREWING COMPANY, 3939 W. Highland Blvd., Milwaukee, WI 53201.

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INVITRON

SOFTWARE QUALITY CONTROL SPECIALIST

This position is responsible for establishing and auditing software policies, standard project procedures, standard programming procedures, documentation standards as well as system security and system archives. The ideal candidate will have five years experience in software quality control preferably in a heavy government regulated industry. Prior work experience should include UNIX, C, PASCAL and fourth generation languages with Sperry 1100 experience an advantage.

For immediate consideration, please submit your resume to:

Mike Harris
INVITRON CORPORATION
4649 LeBourget Drive
St. Louis, Missouri 63134

EOE/AAP Employer

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- **DOS VSE VM SYSTEMS PROGRAMMER**
- **IBM S/38, S/38, S/34 - RPG III, RPG II**
- **IMS DB/DC, CICS, COBOL, PL/1, IDMS, PRO IV, HOGAN**
- **Senior Level Professionals need only apply.**

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RAND SYSTEMS CORPORATION

RAND SYSTEMS CORPORATION

7071 Orchard Lake Road, Suite 305
West Bloomfield, MI 48322
(313) 855-6877

All replies held in strictest confidence

EOE

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We're looking for an individual to implement new project management methodologies/processes throughout our multi-faceted organization. This position involves responsibility for establishing system documentation, training, reporting and automation procedures related to the product development process using state-of-the-art project management tools.

The person we seek will have at least 5 years experience involving large system project management methods with an IBM environment. This must include the actual implementation of project management methodologies at 2 or 3 prior sites along with the associated knowledge of the impact brought upon a corporation by those changes.

If you have strong leadership and communication skills, you'll find a perfect fit with System One. We offer an opportunity to advance your career with a winning company. Our compensation package is considered excellent. Find out more. Send a resume with salary history in strictest confidence to, **System One Corporation, Human Resources, Dept. JDJ/PMI, Suite 1901, 2929 Allen Parkway, Houston, Texas 77019.**

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SENIOR DATA BASE ANALYST

The successful candidate will be Senior member of the team responsible for maintaining an ADABAS database management system to provide database service, to implement and maintain system security and performance monitoring software and also to develop improved techniques in the use of database software. Responsibilities include installing, maintaining and monitoring Software AG products for both administrative and academic use. Products include ADABAS, NATURAL, NATURAL SECURITY, PREDICT and REVIEW. ADABAS experience preferred; however, any database experience is acceptable.

The Board of Regents Higher Education Computing System (BOR/HECS) is located in Vermillion, South Dakota on the University of South Dakota campus. The computing center is responsible for state-wide administrative computing functions as well as providing academic computing to all state institutions of higher education. The qualified applicant must have graduated from a college or university with a bachelor's degree in computer science or a related field plus three years of data processing project development experience of which two years must be directly related to systems work, or an equivalent combination of education and experience. The maximum starting salary is $28,164 annually.

Vermillion is located near the Missouri River in extreme southeastern South Dakota, 60 miles south of Sioux Falls, South Dakota and 120 miles north of Omaha, Nebraska.

Application and/or resume must be postmarked on or before February 19, 1988. For more information call Rachel Barari at (605) 677-5047 or send state application form or resume to University of South Dakota, Personnel Officer, Slagle Hall 207, 414 E. Clark Street, Vermillion, South Dakota 57069.

The South Dakota Board of Regents is an EOE/AA employer and educational system.

COMPUTER SCIENCE

ANALYST/ PROGRAMMER

Energy Management System (EMS)

Tri-State Generation is a nonprofit, wholesale supplier of electrical power to 25 rural distribution cooperatives in Colorado, Wyoming and Nebraska.

This position is responsible for the development and implementation of realtime software systems.

Five years experience with realtime computer systems software development. Knowledge of electric power SCADA and/or applications software desirable. Leeds and Northrup EMS using Gould SEL 3277 computers, with MPX operating system experience desired. FORTRAN programming experience.

Competitive benefits package including relocation assistance.

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(303) 452-6111
Ext. 161

Tri-State
Generation &
Transmission
Association, Inc.

Dept. 0148
PO Box 33695
12076 Grant St.
Denver, CO 80233

EOE/M/F/H/V

DATA PROCESSING PROFESSIONALS

Senior Systems Analyst Programmer

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Systems Analyst Programmer

1 year minimum computer programming experience. Experience in programming for manufacturing systems preferred.

Both positions require degree and IBM experience on large mainframe. Must be competent in COBOL, CICS, DOS/VSE JCL and experienced in DBMS, preferably ADR DATACOM/DB. Will consider experience in DL1, SQL, DB2 or any relational type DBMS.

Senior Data Base Analyst

Degree preferred. 3 years minimum experience in large data base development projects and/or data base design. Proven experience with ADR DATACOM/DB, Datadictionary and IDEAL. Must be familiar with DOS/VSE Operating System and JCL, VSAM, CICS.

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CW-B5004
Computerworld
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EOE

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Applicant must have 2 years college credit in Computer Science, Math or Engineering plus two years ACP/TPF Airline Environment programming experience. Salary $538/week for a 40 hour work week.

Apply at the Texas Employment Commission, Fort Worth, Texas, Job Order #4793833. Ad paid for by an equal employment opportunity employer.

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Five years experience with VAX equipment, associated higher order language operating systems, and a major relational database which includes three years of detailed experience with the INGRES database system. Also two years experience as a Project Manager of a major ADP support program. BS in Computer Science or related field required.

SYSTEMS ANALYST

Five years ADP experience including three with VAX equipment and four with a major relational database which includes at least two years with the INGRES database system.

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Five years experience with VAX equipment and an associated higher order relational database language including at least two years as a Data Base Manager for a major activity. BS in Computer Science or related field required.

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122 Edward Wakefield
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EOE

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Will develop operating system specifications, code, test, install programs to satisfy their programming functional specifications. Responsible for training & supervising work of 2 or more ACP/TPF entry level programmers.

Applicant must possess a bachelors degree or equivalent with major field of study in CS, Math or Engineering plus 2 years experience ACP/TPF airline programming.

Education and experience will be found acceptable if applicant has combination of professional development courses and work experience found to be equivalent to a BS degree in Computer Science. In addition to 2 years of ACP/TPF airline programming.

Salary is $3,042/month for a 40 hour work week.

Apply at the Texas Employment Commission, Ft. Worth, TX, Job Order #4793834. Ad paid by an equal employment opportunity employer.

ACP/TPF Software Analyst

Will act as an ACP/TPF Software Engineer Consultant utilizing assembler programming language to upgrade airline reservation systems in ACP/TPF programming environment.

High School education and 4 years ACP/TPF airline programming experience required.

Salary is $15.25/hour for a 40 hour work week. Job location: 4200 Amon Carter Blvd., Fort Worth, TX.

Interested applicants please contact Chris Lancashire or Alisa Curreri, Computer People, Inc., 2049 Century Park East, Ste. 3390, Los Angeles, CA 90067. 213/551-2647.

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EOE/AA

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BOSTON: Robert Kleven & Co., Inc
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Lexington, MA 02173 (617) 861-1020
CHICAGO: Thomas Hirtz & Associates
150 North Wacker Drive, Suite 1700
Chicago, IL 60606 (312) 977-1555
CINCINNATI: Task Group
7875 Reading Road
Cincinnati, OH 45237 (513) 821-8275
CLEVELAND: Innovative Resources, Inc
Statler Office Tower, Suite 426
East 12th & Euclid
Cleveland, OH 44115 (216) 621-4220
COLUMBUS: Michael Thomas, Inc
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Worthington, OH 43085 (614) 846-0926
DALLAS: DataPro Personnel Consultants, Inc
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Dallas, TX 75240 (214) 661-8600
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HOUSTON: Career Consultants, Inc
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INDIANAPOLIS: The Consulting Forum, Inc
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Indianapolis, IN 46268 (317) 846-6630
KANSAS CITY: DP Career Associates
6405 Metcalf, Suite 502
Shawnee Mission, KS 66202 (913) 236-8288
LOS ANGELES: Superior Resources, Inc
22653 Pacific Coast Highway, Suite 1-106
Malibu, CA 90265 (818) 884-3000
MIAMI: Data Sciences Personnel, Inc
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MILWAUKEE: EDP Consultants, Inc
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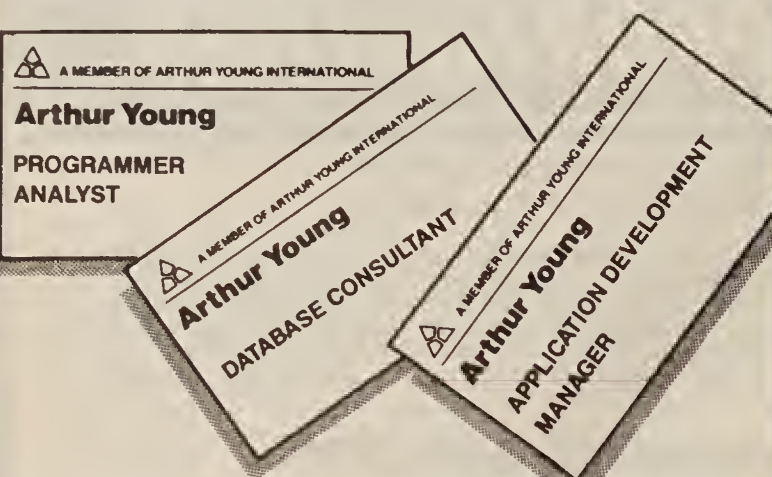
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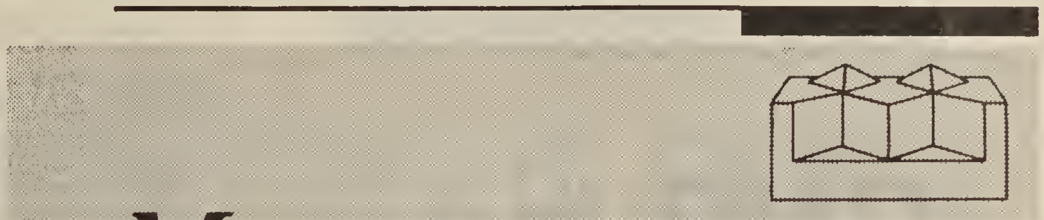

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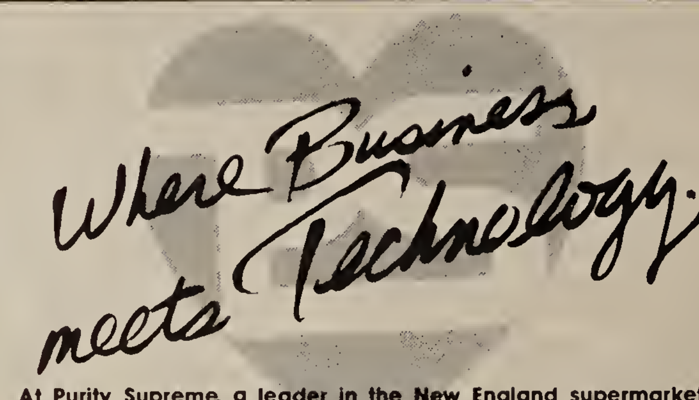
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— Max Steiner
Director of Marketing
Kenda Systems, Inc.

Max Steiner remembers his days as a salesman, when he would make calls and, invariably, see a copy of *Computerworld* on the desks of his clients. That alone made an impression on Max.

Today, he is Director of Marketing for Kenda Systems, a software services firm with offices in New England, New York and Washington, DC, and specializing in placing contract engineers within the high-tech industry. Having grown by 400 percent annually for the last three years — and having placed several hundred professionals in less than three years, Kenda Systems is an acknowledged leader in the industry.

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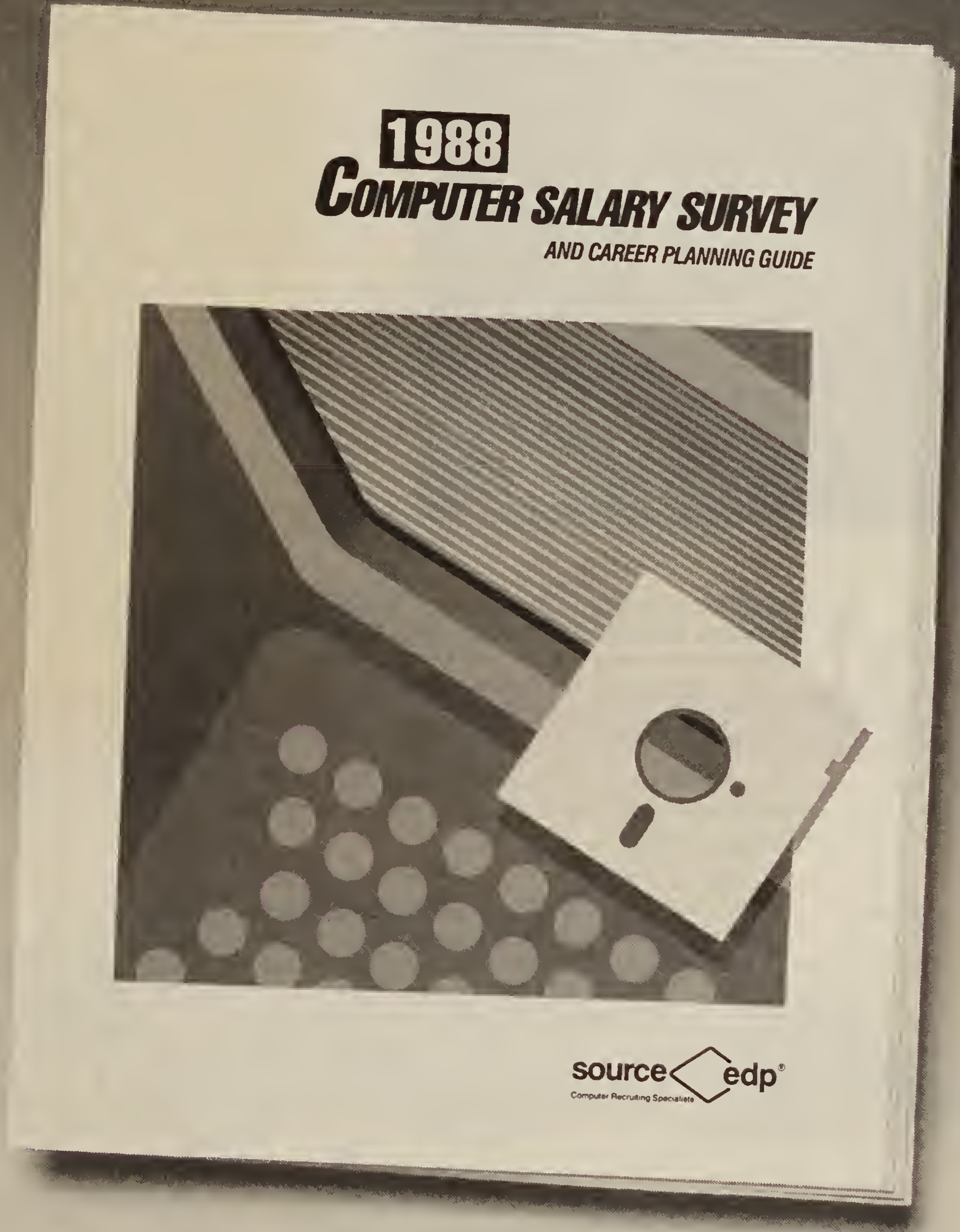

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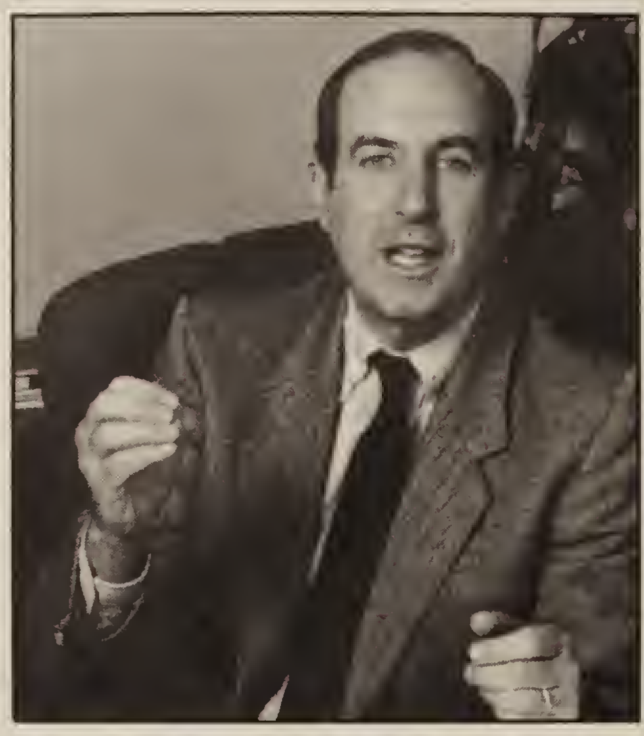

— Michael Gill
Senior Vice President/
Creative Director
Thompson Recruitment Advertising

Michael Gill is Senior Vice President and Creative Director of Thompson Recruitment Advertising, based in Los Angeles, California. In 1986, Thompson won more EMA awards than its three largest national competitors— combined. The company's advertising goal is a simple but demandiing one: To create the most effective recruitment advertising in the marketplace.

Thompson can point to many reasons for its success. And one of the first that comes to mind, Michael says, is Computerworld and its Employment Today section.

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'It's going to be a great month'

Volume transactions on the rise; dealers see micro trends emerging

BY ELIZABETH LOZANO
BOSTON COMPUTER EXCHANGE CORP.

The market experienced heavy trading and high profits the week of Jan. 4. Volume transactions of used equipment are on the rise, and trade-in equipment is flooding the market. As one California reseller exclaimed, "It's going to be a great month."

Used equipment dealers are excited about the trends they see in the microcomputer market. There is a growing difference between the interests of small businesses and those of large corporate users.

Smaller users are neither ready nor willing to abandon DOS. When they upgrade, they are primarily buying Intel Corp. 80386-based DOS machines, networks and minicomputers, while large corporate users are buying IBM Personal System/2 models and adopting OS/2, the proprietary operating system developed by IBM and Microsoft Corp.

In spite of IBM's marketing push, there are still a lot of users who are literally missing the bus.

Network and minicomputer resellers are excited as well. OS/2 makes it easier to decide to purchase a minicomputer system instead of dealing with the uncertainties of personal computer networking.

PC trading even

The IBM Personal Computer traded even at $700 for the week ending Jan. 8. The classic 256K-byte, two-floppy disk drive monochrome system experienced a decrease in both supply and end-user demand.

The PC XT Model 086, however, experienced an unexpected sharp increase in demand. With the high price of the 20M-byte Model 089, the 10M-byte Model 086 is worth purchasing and upgrading. The Model 086 closed even at $1,300 with a high trading volume.

The PC AT models also performed well in the week ending Jan. 8. The Model 099 closed down slightly at $2,225, with demand for systems with larger storage increasing. The Model 339, however, continued to increase in value this week and closed at $3,550.

Compaq Computer Corp. trading was a mixed bag. The Portable I closed even with the PC Model 076, dropping down to $700. The Portable II closed even at $1,700 with a decrease in volume. The Portable III, however, was in hot demand and closed up, at $2,600. The 10M-byte luggable Compaq Plus closed down $25 at $1,250, and laptops such as the Toshiba America, Inc. T3100/10 became more available on the used market.

Compaq 286 trading experienced conditions consistent with those of the week ended Jan. 1. The Deskpro 286 model closed even at $2,175. The Compaq 386 models continue to dominate 386 trading, although supply conditions remain unfavorable for buyers. The Deskpro 386 closed up at $4,375, with tight supply.

In addition, Apple Computer, Inc. Macintosh buyers are on a rampage. Used MacSE machines are in high demand. The MacSE closed up at $1,925, with buyers outnumbering sellers by at least 4 to 1.

The Mac Plus, however, took a tumble in the week ended Jan. 8. The machine that took students and the business world by storm closed down at $1,300. The Mac 512E closed even at $1,000, with an increase in demand for quantities.

The Boston Comptuer Exchange can be reached at 800-BOCOEXX, or 617-542-4414 in Massachusetts.

The BoCoEx Index

Closing prices report for the week ending Jan. 8, 1988

	Closing price	Recent high	Recent low
IBM PC Model 076	$700	$875	$350
XT Model 086	$1,300	$1,425	$800
XT Model 089	$1,850	$2,050	$1,100
AT Model 099	$2,225	$2,900	$2,250
AT Model 339	$3,550	$3,700	$2,800
Compaq Portable I	$700	$975	$600
Portable II	$1,700	$1,900	$1,550
Portable III	$2,600	$2,750	$2,200
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Deskpro 286	$2,175	$2,500	$2,050
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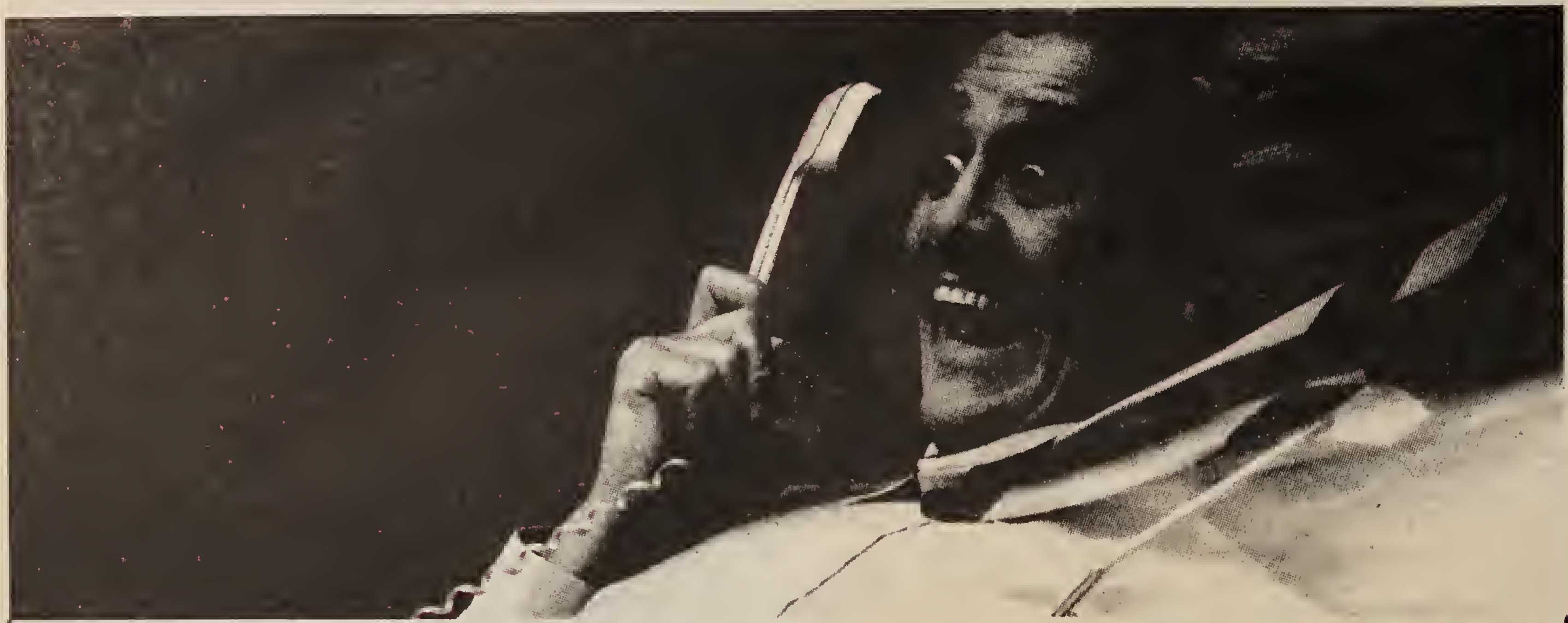

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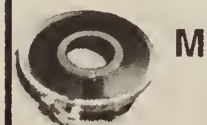

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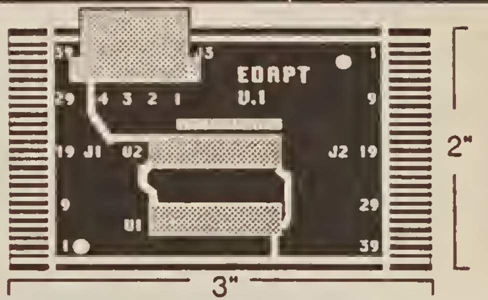

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Poor user training is expensive

BY NAOMI KARTEN
SPECIAL TO CW

Computer training is expensive, no question about it. But what is the cost, or organizational impact, of sending people into the trenches without adequate formal preparation?

For many users, ease of learning does not apply to the cryptic commands and ornery error messages they see on their screen. If training isn't available, repercussions can fall into two categories: limited use of expensive computer equipment and the potential for misuse.

The obvious price of limited use is the cost of the equipment plus employee time, as users flounder away on their own. Less obvious, however, is the lost opportunity — the value of the benefit that could be achieved.

Without training, users take longer to reach a given competency level. Many trainers estimate that learning a specific set of skills takes three to six times as long without training. Most personal computer classes run a minimum of one day; thus, users who learn on their own must devote several days.

But many potential users simply do not bother. Learning from scratch on their own is impossible for many people. So the equipment sits idle.

Other users plunge ahead and learn as much as they can on their own. But since they are forced to take time from other priorities, they rarely reach the same level of competency as trained employees.

Untrained users often make only minimal use of the capabilities of their system. Familiar examples are the failure to use word processing style sheets, spreadsheet range naming functions and Microsoft Corp. MS-DOS batch files.

Because untrained users frequently lack a broad perspective of what computers can do, they are unable to see beyond the bounds of the current application.

That product-oriented focus results in an inability to intelligently apply the technology to solve business problems and identify opportunities.

Karten is president of Karten Associates in Randolph, Mass., and editor of "Managing End-User Computing."

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Topics like connectivity, operating systems and languages, productivity software, departmental computing, security and many more are studied and analyzed from a total systems perspective. Critical issues involving PCs, communications and software will be covered several times during 1988. All get precise, cover-to-cover treatment in *Computerworld Focus.*

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Take a look at what *Focus* has planned for 1988.

Computerworld Focus 1988 Schedule

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Feb. 3	Dec. 31	Software Operating Systems & Languages	Uniforum
Mar. 2*	Jan. 29	Departmental Computing	NCGA/Interface/ WCC
Apr. 6	Mar. 4	Data Security	
May 4	Apr. 1	Communications/ Connectivity	Comdex Spring/ ICA
June 1*	Apr. 29	PC End User Productivity	PC Expo
July 6	June 3	Software	
Aug. 3	July 1	Departmental Computing	
Sept. 7	Aug. 5	Communications	TCA
Oct. 5	Sept. 2	Software Productivity	Unix Expo/Info '88/ Dexpo West
Nov. 2	Sept. 30	PC/Connectivity	Comdex Fall
Dec. 7	Nov. 4	Departmental Computing	

* Starch Ad Study Issue

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COMPUTERWORLD

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March 14	DBMS	Feb. 26
March 28	Micro-to-Host-Links	March 11
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May 9	Printers	April 22
May 23	Data Communications	May 6
June 6	CASE	May 20
June 20	The SNA Market	June 3
July 11	Disaster Prevention & Recovery Products & Services	June 24
July 25	Productivity Software	July 8

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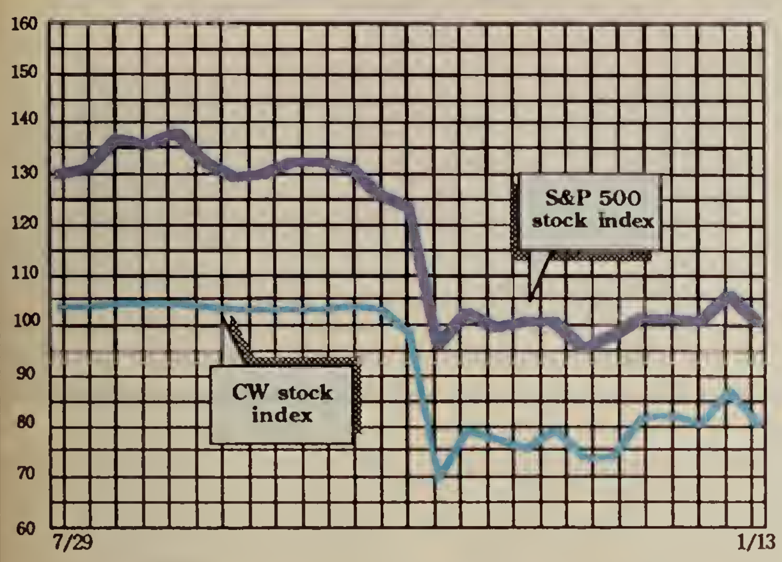

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Software & DP Services	102.5	**93.0**
Semiconductors	64.5	**57.1**
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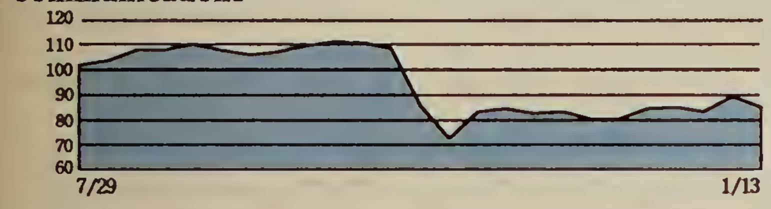
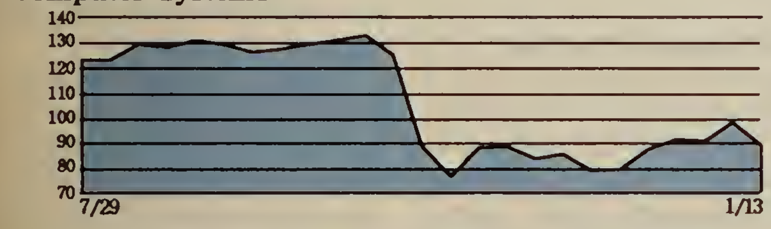
Composite Index	86.5	**80.2**
S&P 500 Index	105.5	**100.2**

Communications



Computer Systems



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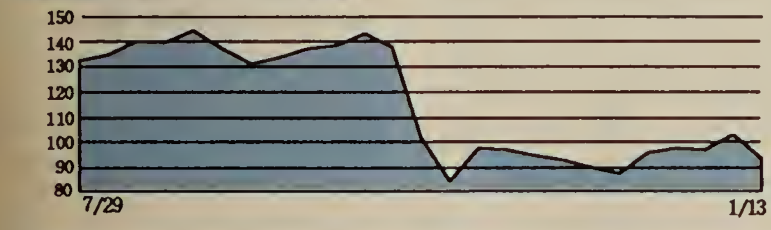

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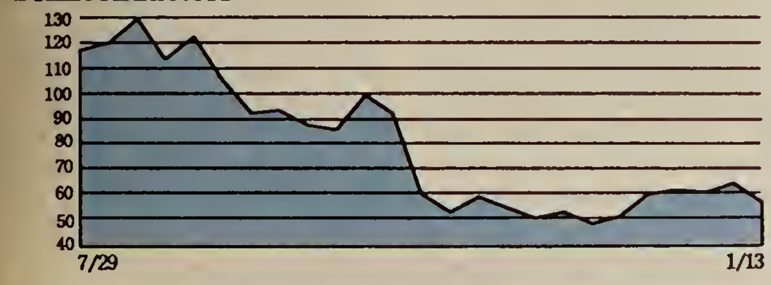

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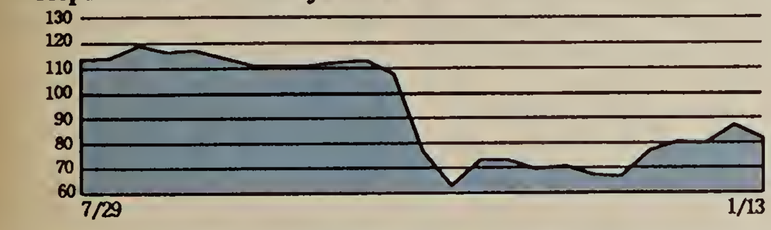
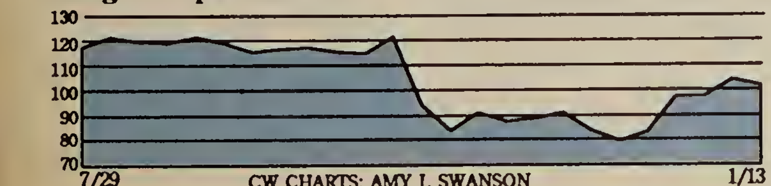


Leasing Companies



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CLOSING PRICES WEDNESDAY, JANUARY 13, 1988

Communications and Network Services

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE JAN. 13 1988	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN INFO TECHS CORP	100	74	86.38	1.13	1.32
Q	ANDREW CORP	19	11	13.00	-1.50	-10.34
Q	ARTEL COMM CORP	5	2	2.13	0.00	0.00
N	AT&T	36	20	28.00	-0.25	-0.88
Q	AVANT GARDE COMP INC	6	2	2.25	0.13	5.88
Q	AVANTEK INC	19	7	7.13	-1.25	-14.93
N	AYDIN CORP	38	16	18.88	-0.38	-1.95
N	8ELL ATLANTIC CORP	80	61	66.75	-0.25	-0.37
N	8ELLSOUTH CORP	44	29	37.25	0.13	0.34
Q	COMPRESSION LA8S INC	8	2	3.13	-0.75	-19.35
0	COMPUTER NETWORK TECH	6	2	2.00	0.06	3.20
0	CONTEL CORP	40	25	30.63	0.63	2.08
Q	DATA SWITCH CORP	9	4	6.38	0.00	0.00
Q	DIGITAL COMM ASSOC	49	20	29.00	-4.00	-12.12
Q	OYNATECH CORP	44	14	19.75	-2.00	-9.20
Q	FIBRONICS INTERNATIONAL INC	11	2	2.63	0.13	5.00
Q	GANDALF TECHNOLOGIES	11	5	6.13	-0.38	-5.77
Q	GENERAL DATACOMM INDS	14	3	4.00	-0.13	-3.03
N	GTE CORP	45	29	34.63	-1.25	-3.48
Q	INFOTRON SYS CORP	12	5	6.75	-0.25	-3.57
N	ITT CORP	66	42	44.13	-3.13	-6.61
N	M A COM INC	16	7	9.75	-0.38	-3.70
Q	MCI COMMUNICATIONS CORP	12	5	10.38	-0.13	-1.19
Q	MICOM SYS INC	18	7	8.25	-0.50	-5.71
Q	NETWORK SYS CORP	19	7	8.63	-0.75	-8.00
N	NORTHERN TELECOM LTD	24	14	18.13	-0.75	-3.97
Q	NOVELL INC	30	12	21.50	-3.00	-12.24
N	NYNEX CORP	78	58	64.25	-0.75	-1.15
N	PACIFIC TELESIS GROUP	34	9	26.63	0.13	0.47
N	PARAOYNE CORP	9	4	3.75	-0.38	-9.09
A	PENRIL CORP	6	1	3.25	-0.13	-3.70
N	PLESSEY PLC	41	23	28.38	-1.13	-3.81
N	SCIENTIFIC ATLANTA INC	20	8	11.25	-0.63	-5.26
N	SOUTHWESTERN 8ELL CORP	46	22	35.13	0.38	1.08
Q	3 COM CORP	26	12	18.88	-2.50	-11.70
N	TIMEPLEX INC	41	17	32.25	-3.25	-9.15
Q	UNGERMANN 8ASS INC	16	5	7.38	-0.50	-6.35
N	U S WEST INC	60	43	50.38	-0.88	-1.71

Computer Systems

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE JAN. 13 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLIANT COMPUTER SYS	37	5	7.25	-1.50	-17.14
Q	ALPHA MICROSYSTEMS	6	3	4.38	-0.13	-2.78
Q	ALTOS COMPUTER SYS	17	9	10.88	-1.25	-10.31
A	AMDAHL CORP	50	19	31.88	-4.75	-12.97
Q	APOLLO COMPUTER INC	25	9	11.75	-1.88	-13.76
Q	APPLE COMPUTER INC	60	22	42.25	-1.50	-3.43
N	BOLT 8ERANEK & NEWMAN	30	12	16.88	-0.63	-3.57
Q	8RITTON LEE INC	5	1	1.38	0.00	0.00
N	COMPAQ COMPUTER CORP	79	22	52.88	-6.13	-10.38
Q	COMPUTER AUTOMATION INC	17	4	8.38	-1.00	-10.67
A	COMPUTER CONSOLES INC	12	2	4.88	-0.75	-13.33
Q	CONCURRENT COMP CORP	24	11	16.50	-0.63	-3.65
N	CONTROL DATA CORP OEL	38	18	19.88	-3.38	-14.52
Q	CONVERGENT TECH	12	3	3.88	-0.50	-11.43
Q	CONVEX COMPUTER CORP	22	6	7.88	-1.00	-11.27
N	CRAY RESH INC	136	47	72.25	-7.38	-9.26
Q	DAISY SYS CORP	13	5	6.75	-0.38	-5.26
N	DATA GEN CORP	39	16	25.13	-0.88	-3.37
N	DATAPOINT CORP	9	3	4.38	-0.25	-5.41
N	OIGITAL EQUIP CORP	200	110	122.75	-18.00	-12.79
N	FLOATING POINT SYS INC	17	3	3.88	-0.38	-8.82
N	GOULD INC	34	8	12.88	0.25	1.98
N	HARRIS CORP	43	22	25.88	-1.50	-5.48
N	HEWLETT PACKARO CO	74	36	54.50	-5.13	-8.60
N	HONEYWELL INC	91	49	56.75	-4.00	-6.58
N	I8M	176	102	116.13	-6.75	-5.49
Q	INFORMATION INTL INC	17	9	10.13	-0.63	-5.81
Q	IPL SYS INC	3	2	1.75	-0.25	-12.50
Q	MASS COMPUTER CORP	14	5	5.63	-0.63	-10.00
N	MATSUSHITA ELEC INDL LTO	196	93	175.50	-5.88	-3.24
Q	MEGADATA CORP	7	3	3.50	-0.13	-3.45
Q	MENTOR GRAPHICS CORP	39	14	20.75	-4.00	-16.16
N	N8I INC	14	4	3.75	-0.50	-11.76
N	NCR CORP	87	50	60.25	-5.88	-8.88
N	PRIME COMPUTER INC	31	12	15.00	-2.13	-12.41
Q	PYRAMIO TECHNOLOGY	12	5	7.75	-0.75	-8.82
Q	STRATUS COMPUTER	41	15	22.75	-4.00	-14.95
Q	SUN MICROSYSTEM INC	46	14	36.38	-0.38	-1.02
Q	SYMBOLICS INC	6	1	1.19	-0.50	-29.62
N	TANDEM COMPUTERS INC	38	19	20.25	-7.38	-26.70
N	TANDY CORP	57	28	33.50	-2.25	-6.29
N	ULTIMATE CORP	37	16	16.13	-3.50	-17.83
N	UNISYS CORP	48	24	32.50	-3.38	-9.41
A	WANG LABS INC	19	10	13.25	-0.50	-3.64

Software & DP Services

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE JAN. 13 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	AOVANCED COMP TECH	6	1	1.88	-0.13	-6.25
N	AGS COMPUTERS INC	30	11	16.25	-1.13	-6.47
Q	AMERICAN MGMT SYS INC	20	9	12.38	-3.00	-19.51
Q	AMERICAN SOFTWARE INC	22	6	9.25	0.13	1.37
N	ANACOMP INC	11	4	7.00	-0.38	-5.08
Q	ANALYSTS INTL CORP	10	4	7.50	-0.75	-9.09
Q	ASHTON TATE	33	13	24.75	-2.00	-7.48
Q	ASK COMPUTER SYS INC	17	6	7.25	-1.13	-13.43
Q	AUTOOESK INC	34	12	19.25	-2.75	-12.50
N	AUTO DATA PROCESSING	55	16	38.88	-5.25	-11.90
Q	BOOLE & 8A8BAGE INC	12	5	8.00	0.25	3.23
N	COMPUTER ASSOC INTL INC	37	15	28.25	-2.63	-8.50
Q	COMPUTER HORIZONS CORP	15	7	9.63	-0.63	-6.10
N	COMPUTER SCIENCES CORP	73	42	47.50	-4.13	-7.99
N	COMPUTER TASK GROUP INC	18	9	10.75	-0.38	-3.37
Q	COMSHARE INC	28	12	12.75	-2.00	-13.56
N	CULLINET SOFTWARE INC	14	4	6.75	0.63	10.20
Q	CYCARE SYS INC	10	6	6.13	-0.38	-5.77
Q	DUQUESNE SYS INC	33	10	18.00	-3.75	-17.24
A	DATA ARCHITECTS INC	17	7	9.00	-1.13	-11.11
N	GENERAL MTRS (CLS E)	51	27	34.50	-4.38	-11.25
Q	HOGAN SYS INC	17	5	5.13	-0.25	-4.65
Q	INFORMIX CORP	31	11	20.75	-3.00	-12.63
Q	INTELLICORP INC	11	3	3.50	-0.38	-9.68
Q	KEANE INC	10	6	7.00	0.00	0.00
Q	LOTUS OEV CORP	40	19	28.00	-5.50	-16.42
Q	MANAGEMENT SCI AMER	21	6	6.13	-0.63	-9.26
Q	MICRO PRO INTL CORP	8	3	3.56	0.00	0.00
Q	MICROSOFT CORP	79	29	56.75	-1.75	-2.99
Q	MORINO ASSOCIATES INC	24	7	14	0.00	0.00
Q	NATIONAL DATA CORP	34	19	26.25	-1.25	-4 55
Q	ON LINE SOFTWARE INTL INC	22	9	11.38	-0.63	-5.21
Q	ORACLE SYS CORP	19	6	13.25	-1.88	-12.40
N	PANSOPHIC SYS INC	28	11	14.00	-2.25	-13.85
Q	POLICY MGMT SYS CORP	30	15	19.25	-1.25	-6.10
Q	PROGRAMMING & SYS INC	14	7	8.63	-0.63	-6.76
Q	REYNOLDS & REYNOLOS CO	39	14	17.25	-0.63	-3.50
Q	SEI CORP	18	10	15.50	-0.25	-1.59
Q	SHARED MED SYS CORP	53	19	22.75	-1.00	-4.21
Q	SOFTWARE AG SYSTEMS INC	19	8	7.88	-0.50	-5.97
Q	SOFTWARE PU8G CORP	17	5	9.00	0.75	9.09
A	STERLING SOFTWARE INC	14	6	6.25	-1.25	-16.67
Q	SUNGARO OATA SYS INC	21	10	13.75	-2.25	-14.06
Q	SYSTEMATICS INC	30	19	25.25	-1.63	-6.05
N	SYS. SOFT INC	24	7	13	-1.25	-8.62
Q	VM SOFTWARE INC	45	7	8.00	-2.00	-20.00

Semiconductors

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE JAN. 13 1988	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADV MICRO DEVICES INC	25	8	9.50	-1.25	-11.63
N	ANALOG OEVICES INC	24	8	11.00	-1.13	-9.28
Q	ANALOGIC CORP	13	5	6.25	-0.25	-3.85
Q	INTEL CORP	42	17	24.75	-4.00	-13.91
Q	LSI LOGIC CORP	17	7	9.25	-1.00	-9.76
N	MOTOROLA INC	74	35	45.88	-6.13	-11.78
N	NATL SEMICONOUCTOR	22	10	10.88	-1.63	-13.00
N	TEXAS INSTRS INC	80	36	49.75	-7.88	-13.67
A	WESTERN DIGITAL CORP	33	12	13.00	-3.75	-22.39

Peripherals

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE JAN. 13 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	ALLOY COMP.	13	4	4.25	-0.50	-10.53
N	AM INTL INC	9	3	5.63	0.25	4.65
Q	AST RESH INC	23	6	8.38	-0.38	-4.29
Q	AUTO TROL TECH CORP	9	3	3.25	-0.50	-13.33
Q	8ANCTEC INC	16	5	7.38	-0.38	-4.84
Q	CIPHER OATA PROOS INC	18	4	6.38	-1.13	-15.00
A	COGNITRONICS CORP	5	2	3.25	0.50	18.18
N	COMPUGRAPHIC CORP	28	19	22.13	-0.88	-3.80
N	COMPUTERVISION CORP	23	7	14.88	0.75	5.31
A	DATAPROOUCTS CORP	24	7	7.75	-0.88	-10.14
A	DATARAM CORP	9	5	6.38	0.00	0.00
N	OECISION INDS CORP	13	4	10.75	0.00	0.00
N	EASTMAN KODAK CO	71	42	49.00	-2.88	-5.54
Q	E M C CORP MASS	29	10	14.50	-1.75	-10.77
Q	EMULEX CORP	9	4	5.88	-0.75	-11.32
Q	EVANS & SUTHERLANO	40	18	20.50	-3.50	-14.58
Q	ICOT CORP	13	3	4.13	-0.38	-8.33
Q	INTERLEAF INC	24	9	16.25	-2.50	-13.33
Q	IOMEGA CORP	8	1	2.75	0.63	29.41
Q	LEE DATA CORP	10	3	3.00	-0.19	-5.90
Q	MASSTOR SYS CORP	6	1	1.94	-0.19	-8.80
Q	MAXTOR CORP	34	6	10.13	-0.38	-3.57
Q	MICROPOLIS CORP	44	13	21.25	-4.00	-15.84
Q	MINISCRIBE CORP	18	5	8.38	-1.88	-18.29
N	MINNESOTA MNG & MFG CO	84	45	60.75	-5.25	-7.95
A	MSI DATA CORP	24	12	18.63	-1.63	-8.02
Q	PRIAM CORP	6	1	1.75	-0.25	-12.50
Q	PRINTRONIX INC	13	7	7.38	-1.38	-15.71
N	QMS INC	27	10	9.75	-1.75	-15.22
Q	QUANTUM CORP	35	8	10.25	-2.25	-18.00
Q	RAMTEK CORP	6	2	3.75	-0.13	-3.23
N	RECOGNITION EQUIP INC	27	7	9.50	-1.25	-11.63
Q	REXON INC	14	5	5.88	-0.63	-9.62
Q	SCAN TRON CORP	17	7	10.75	0.00	0.00
Q	SEAGATE TECHNOLOGY	46	10	16.25	-1.00	-5.80
N	STORAGE TECH CORP	5	1	1.88	-0.25	-11.76
Q	TANDON CORP	7	2	1.88	-0.06	-3.25
A	TEC INC	7	3	5.00	-0.88	-14.89
N	TEKTRONIX INC	43	21	24.38	-0.88	-3.47
Q	TELEVIOEO SYS INC	3	1	1.38	0.00	0.00
N	TELEX CORP	102	30	57.63	1.88	3.36
Q	WYSE TECH	40	11	22.00	-1.88	-7.85
N	XEROX CORP	85	50	57.75	-3.38	-5.52
Q	XIOEX CORP	16	6	6.63	-0.38	-5.36

Leasing Companies

EXCH		PRICE 52-WEEK RANGE (1)		CLOSE JAN. 13 1988	WEEK NET CHNGE	WEEK PCT CHNGE
Q	CAPITAL ASSOCIATES INTERNATIONAL INC	11	4	4.00	-0.50	-11.11
N	COMOISCO INC	37	12	17.25	-3.13	-15.34
N	CONTINENTAL INFO SYS	14	5	6.50	0.13	1.96
Q	PHOENIX AMERN INC	8	2	2.88	0.13	4.55
Q	SELECTERM INC	6	3	4.00	0.25	6.67

EXCH: N = NEW YORK; A = AMERICAN; Q = NATIONAL;
0 = OVER-THE-COUNTER; S = SPLIT

O-T-C PRICES ARE 8IO PRICES AS OF 3 P.M. OR LAST 8IO
(1) TO NEAREST DOLLAR

Healing

Most tech stocks recover, but DEC, Tandem slip

Friday's stock market rally on news of the lower U.S. trade deficit helped computer stocks recover most of their losses from "Black Friday" one week earlier.

Two key vendors, however, still have a lot of ground to make up. Digital Equipment Corp. had a rough week as three brokerage firms reduced their earnings estimates or bond ratings for the minicomputer maker. DEC, which plunged 11¼ points Jan. 8, sank an additional 11⅛ points in the first four days last week and was unchanged late Friday at 119⅜.

Tandem Computers, Inc.'s announced quarterly earnings shortfall touched off the Jan. 8 minicrash and sent Tandem down a whopping 6¾ points that day to 20⅜. The stock lost another ⅝ of a point in four sessions last week and was down an additional ⅝ late Friday to 19⅛, falling near its 52-week low of 19. IBM gained 1 point in four days to 115⅞ and was up an additional 3¼ points Friday afternoon to 119⅛.

Unisys Corp. was trading at 34⅛ late Friday after opening the week at 32. Hewlett-Packard Co. was up modestly to 56⅞ after starting the week at 54½.

CLINTON WILDER

Dream jobs

CONTINUED FROM PAGE 1

ed software engineering tools.

Many black professionals say conservative forces in the Reagan administration have limited progress during the last year. "Things have gotten a lot tighter during the Reagan years, and we still have a long way to go," says Gerard Anderson, a systems engineer at IBM in West Orange, N.J., and president of Black Data Processing Associates (BDPA), a national professional association based in Philadelphia. But, Anderson declares, "The doors have not closed on us."

WALTER P. CALAHAN

Bemley *(front left) with operation research assistants Judith I. Matthews and Craig Woodfolk.*

"It will take a while to reverse the damage that has been done," Bennett agrees. "Certain departments of government that had oversight or prosecution power seemed to fail to exist during the Reagan administration, giving a signal to the business community."

Professional help

Minorities aiming for DP management seek out professional associations, including BDPA and the Data Processing Management Association (DPMA). Although statistically few DPMA members are black, some 1,000 blacks have joined the BDPA (see chart at right).

There are no statistics on the number of black DP professionals who may have strived for management positions and found the door barred for one reason or another, nor is there any empirical documentation on the role that racism may play.

An oft-cited aspect of the lack of progress is that blacks have limited professional networking opportunities with white managers and so do not have the contacts that often play a role in promotions to management-track positions. One reason blacks turn to BDPA and the DPMA is to develop networking skills and make contacts that may further career paths.

The DPMA says it is aggressively seeking to recruit minority membership, and BDPA — with 30% of its membership classified as entrepreneurial — is strongly urging blacks to pursue corporate management careers.

"We're trying to help black professionals in large corporations make the transition from technical personnel to management" through seminars, networking and outreach to black students, Anderson says.

Seeking opportunities that elude them in the private sector, many black DP professionals go to Washington, D.C., where the federal government and its contractors are required by law to hire and promote minorities.

But frustration is evident even among blacks working in government computer installations.

Stepped over

"In the government, GS-13 is the highest pay level you can go and still be a programmer," explains Norman Keith, a systems analyst with the Internal Revenue Service. "To go to GS-14 and beyond, you'd have to become a manager, and to do that, you have to be sponsored by your manager and by a branch chief." But only a small percent of black systems analysts make the leap to GS-14, he says.

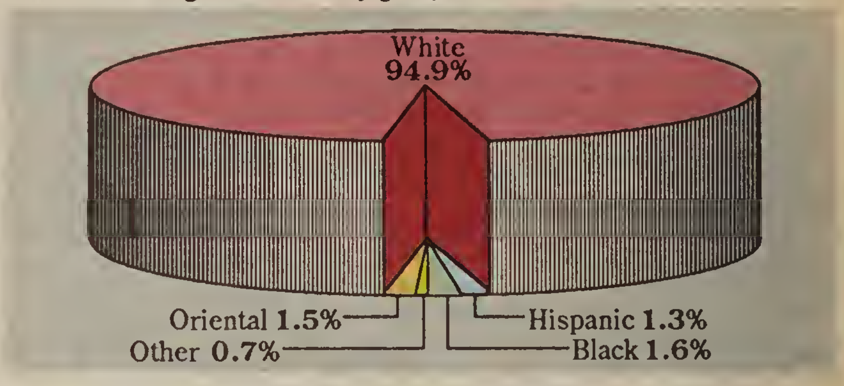
Some blacks in government MIS organizations have faced the shock of training a less qualified person and finding out later that that person will become his manager. "You find a lot of blacks don't move up in their profession because younger white people move ahead of them," says Jesse Bemley, education chairman of BDPA and information manager of the U.S. Army Cost and Economic Analysis Center. "If you're really good, you could appear to be a threat to others who want to move up."

The rules of government hiring have changed subtly during the Reagan administration, some black DP personnel say. "The very definition of a minority has changed in the last few years," says one woman who works for the Department of Defense. "Jobs that once went to blacks and Hispanics now go to white women and Asian people who have only recently become citizens of this country."

Outside of government, many black DP professionals seem resigned to their inability to reach upper levels of management and have chosen to move from one Fortune 500 company to another in pursuit of higher salaries and better benefits, but not a better title.

Barely managing

Survey of 1,850 DPMA members found that only one in 20 belongs to a minority group



INFORMATION PROVIDED BY DATA PROCESSING MANAGEMENT ASSOCIATION
CW CHART

"Mostly, it's the large company that still has an interest in maintaining some of the affirmative action guidelines that have been somewhat stifled under the Reagan administration," says Kuumba Kazi-Ferrouillet, managing editor of *The Black Collegian*, a New Orleans-based magazine distributed to 1,200 college campuses nationwide. Among the companies credited with trying to reach, train and promote black college students are IBM, AT&T, Digital Equipment Corp. and Xerox Corp.

However, DP placement agencies, such as Lachman Associates, Inc., in Naperville, Ill., report few inquiries from companies looking specifically to fill job positions with minority candidates.

Credit where it's due

Black MIS managers and observers do credit some corporations with promoting the cause of minority hiring. DEC has a corporate affirmative action group that sets goals for the hiring of minority employees and managers.

Joseph Rocha , who manages minority and female employee programs at DEC, estimates that about 10% of DEC's field engineering group staff, which he monitors, consists of minority employees.

While many blacks say they are blocked from the upper rungs of the corporate ladder, lateral mobility is relatively easy.

"Once you're in DP, you can always move around," says Audrey Gatling, an applications programmer with Du Pont Co. in Wilmington, Del. Gatling has also worked for Automatic Data Processing, Inc. in Mount Laurel, N.J., and Dow Jones & Co. in New York.

In an attempt to bring more blacks into the DP field, some community-based groups have joined BDPA and are trying to create an interest in computers among black high school and college students. One such group is Bemley's Joint Educational Facilities, Inc., which introduces black high school students to rules-based artificial intelligence and personal computers.

"Since the traditional organizations — the colleges and corporations — aren't turning out enough black people with expertise in computer science, we need to create more grass roots-level groups in the community that can accomplish that goal," Bemley says. "We need to get black students interested in computers early so that they can enter our field in greater numbers by the 1990s."

NBS rates IBM Cobol 85 at mid-level

BY CHARLES BABCOCK
CW STAFF

The IBM Cobol 85 compiler tested by the National Bureau of Standards is expected to be an intermediate-level compiler with some high-level features, according to sources familiar with the product.

High-level compilers incorporate the most advanced features of the American National Standards Institute Cobol 85 standard, such as nested programs — similar to PL/I's contained procedures — and external data, similar to Fortran's Common Data. Only Tandem Computers, Inc.'s compiler, which is the first certified high-level product, and a handful of others are on the market now.

The results of the IBM compiler test are expected to be available by the end of this month, but the compiler is not likely to be announced until mid-1988. It will not be made generally available until the fourth quarter of this year, according to William M. Klein, product planner at Application Development Systems, Inc., a San Jose, Calif., Cobol debugger manufacturer. Klein has also been active in the Guide IBM users group's Cobol committee for five years.

The IBM Cobol 85 compiler is expected to take the form of the next release of VS Cobol II, IBM's current Cobol product and its only compiler capable of producing programs in 31-bit mode for the firm's MVS/XA, Klein and other sources said.

"Nested programs are useful primarily for programming projects that have many members of a team. It's extremely difficult to do in a compiler," noted Roger Knights of SPC Systems USA in Seattle, producer of an optional report writer sold by IBM with VS Cobol II. Knights and other sources would not predict which high-level features will be included in the compiler.

Those who've used it

Computerworld also contacted users of IBM's unannounced product that meets the Cobol 85 standard, which IBM spokesmen acknowledged has been available on request since September 1987. The users said they restricted the product's implementation to a few new systems that they do not want to have to convert to the Cobol 85 standard at a later date.

The users noted that the new compiler, when it becomes generally available, will include a Cobol optimizer that will make Cobol 85 programs run as fast as or faster than existing Cobol programs.

"You will not need a third party's optimizer," one user said. "Some of the programs perform superbly today" after compilation by the Cobol 85 product.

This comment runs counter to expectations in some quarters that Cobol 85 programs might be slower because of the structured programming techniques incorporated into the standard. Structured programs are frequently longer than unstructured programs and sometimes have a performance penalty, the users said.

Klein said he expects IBM to unbundle the runtime portion of VS Cobol II from the compiler. The unbundling move would allow one runtime library to be used for all Cobol programs at a site, regardless of whether they meet Cobol 85 standards, he said.

Klein and Knights predicted that the biggest demand for the new compiler will come from large mainframe shops constrained by the 16M-byte addressing limit of MVS/SP programs. To get around the memory limit, programs must be recompiled from 24- to 31-bit mode to take advantage of MVS/XA's 2G-byte ceiling.

IBM is likely to introduce migration aids with the new compiler to ease the transition from Cobol 74, Cobol 68 and earlier versions of the language to Cobol 85, Klein said.

Prime toughens takeover tactics

BY ROSEMARY HAMILTON
CW STAFF

NATICK, Mass. — Prime Computer, Inc. took a hardball approach last week in its attempt to acquire Computervision Corp. with a "final offer" of $15 per share that was packaged with a series of lawsuits.

Prime's latest move came two days after Computervision thumbed its nose at the minicomputer company's original offer of $13.50 per share, made late last month.

Prime also began seeking shareholder consent that would allow it voting rights to shares. If it were to acquire voting rights to a majority of shares, Prime could oust the current Computervision board of directors and replace it with its own people.

The lawsuits are intended to stop a series of takeover measures, including the so-called poison-pill provision and a golden parachute policy, which provides hefty severance deals for top executives.

At press time, a Computervision spokesman said the company was reviewing Prime's latest offer and continues to seek alternative buyers.

Hard pill to swallow

If Prime cannot halt the anti-takeover measures, it will not be able to buy Computervision, a Prime spokesman said. The poison-pill provision would automatically increase the number of outstanding shares greatly once a company acquires 20% of Computervision.

The Prime spokesman estimated that the total number of Computervision shares could increase to as many as 300 million, which would make the purchase of Computervision prohibitive.

Currently, 29 million Computervision shares are outstanding; they would cost Prime approximately $435 million.

Industry analysts contacted last week said Prime's new offering price is not necessarily the final price, although the company said "any further increase would not serve the interests of Prime." Instead, analysts said they consider it the latest attempt by Prime to convince Computervision management to discuss the acquisition.

Until the next final offer

"It's Prime's final offer until they say it isn't anymore," said John Rohal, a senior analyst at Alex Brown & Sons, Inc. in New York.

Laura Conigliaro, a first vice-president at Prudential-Bache Securities, Inc., said that if Computervision is seriously negotiating with another buyer, then Prime will likely increase the price again.

Computervision has said that it is engaged in preliminary discussions with other companies, although it will not identify who the potential buyers may be.

More power to the office

Prime continues trend with superminis

BY JAMES CONNOLLY
CW STAFF

NATICK, Mass. — Prime Computer, Inc. is expected to continue its effort to transfer processing power from the computer room to office environments with the introduction of two mid-range systems tomorrow.

Prime's 4050 and 4150 general-purpose superminicomputers replace the office-class Prime 2755 and 9755, which require a controlled environment. Prime's drive to move more powerful systems into the office dates back to October 1986, when the company introduced the 2755's predecessor, the 2655. Prime is furthering the effort by replacing the 9755 with the desk-high 4150.

The new systems are aimed at distributed processing and are being pitted against IBM's 9370 Models 60 and 90 and Digital Equipment Corp.'s Microvax 3600 and VAX 8530.

"Many people want to be able to distribute power, but a lot of them haven't been able to do it until now because they haven't had the power to stage a lot of users and large data bases on office systems," said Dave Howley, Prime's product manager for mid-range systems.

At a briefing last week, Howley claimed the 4050 and 4150 were designed to run in an office alongside users' desks.

Qualified praise

An analyst briefed by Prime praised the 4050 and 4150 but noted that they are not of the magnitude of Prime's high-end 6550 superminicomputer, which debuted in April 1987.

"As the people at Prime were talking, they seemed to think [the 4050 and 4150] will change their position in the market. But actually, what Prime is doing is continuing to do a good job of enhancing and improving their products," said analyst Sandra Gant of Cupertino, Calif., market research firm Infocorp.

Howley said the systems provide greater performance than did their predecessors at comparable prices. Prime rated the 4050 at 2.8 million instructions per second (MIPS) and the 4150 at 4.1 MIPS, compared with 1.6 MIPS for the 2755 and 3.4 MIPS for the 9755.

The 4050 is said to support up to 128 terminals and the 4150 up to 254 terminals. Each supports up to 32M bytes of memory, which is twice the capacity of the machines' predecessors.

The systems support up to four 496M- or 770M-byte disk drives in office environments. The 4050 can be upgraded to the 4150 through a board swap. Both systems feature a $3,200 optional battery backup.

A 4150 with 24M bytes of memory, a 496M-byte disk drive, a system console and a Primos license costs $191,600. A comparable 4150 with 16M bytes of memory costs $88,000.

Apple PC

FROM PAGE 1

DEC and Apple did provide a laundry list of connectivity services to be addressed under joint development (see story below).

Specific details will not be available until August, when DEC plans to hold a conference with large users and software developers. The Apple spokesman hinted that Apple will have its first DEC connectivity product ready by then.

A survey of sites already mixing Apple and DEC equipment revealed strong interest in the strategic alliance. However, none of the users said they are willing to put their needs on hold until the two vendors actually deliver a product.

The vendors will rely on the International Standards Organization's Open Systems Interconnect (OSI) model as the basis for a connectivity strategy designed to integrate Appletalk and Decnet/OSI environments. The resulting products should enable Apple users to talk to DEC systems on a process-to-process basis and also enable VAX applications to make full use of the Macintosh's user interface, windowing and graphics.

"The message is that open networks, in particular OSI, are the way to go, as opposed to proprietary heirarchical networks," said DEC Vice-President of Business and Office Information Systems Henry Ancona.

Users have their own laundry lists of what they would like to see from the alliance. Most are using a mixture of public domain communications software, standard protocols and Apple's Macterminal, a terminal emulation package. Along with a mix of third-party offerings, these products provide bare-bones communications functions such as file transfer and virtual disk storage.

"The more transparent you can make the peer-to-peer relationship between departmental computers and workstations, [the better]," said Richard Mandelbaum, vice-provost for computing at the University of Rochester in New York. "I'm hoping that an Apple-DEC venture will lead to greater transparency — not only in the DEC environment but in other environments" as well, he added.

Host connections

Other users said they are looking for host connections for their Macintoshes. "Apple certainly needs to do something to connect to major vendors of mainframe computers, and I think that by hooking up with DEC, they can certainly give IBM a run for their money," said Betty Lacompagnon, director of academic computer services at the University of New Hampshire.

Reports of a pending relationship between the two firms have been off and on for about two years, and even DEC and Apple have sometimes seemed confused.

A month ago, Apple's vice-president of market development, Charles Berger, told *Computerworld* that a formal relationship between Apple and DEC was not a "near-term possibility." He denied any negotiations were under way between the two firms.

The Gartner Group, Inc., a research firm based in Stamford, Conn., estimated that 20% to 30% of all micros installed at VAX sites are Macintoshes.

Senior Editor Ed Scannell and senior writer Alan J. Ryan contributed to this story.

Fruits of their labor

The joint development effort between Apple Computer, Inc. and Digital Equipment Corp. covers the following:

- Distributed applications methodology. Users will be able to access DEC VAX-based services using process-to-process communications.
- Network management. Customers will be able to manage Decnet/ISO Open Systems Interconnect (OSI) and Appletalk networks in a unified way.
- Networking. The as-yet-unreleased Decnet/OSI Phase V product will be used to integrate Appletalk networks into wide-area networks.
- File sharing. Apple Macintosh computers will be able to access files and add to files stored on VAX systems using the Appletalk Filing Protocol.
- Document interchange. Revisable forms documents created on the Mac and the VAX will be interchangeable.
- Data base. Mac applications will be allowed to access data on VAX systems through Decnet/OSI.
- Terminal emulation. Macintoshes will be able to emulate DEC terminals to access computers via Decnet/OSI networks.

Specific details will be revealed at an August conference, DEC said.

PATRICIA KEEFE

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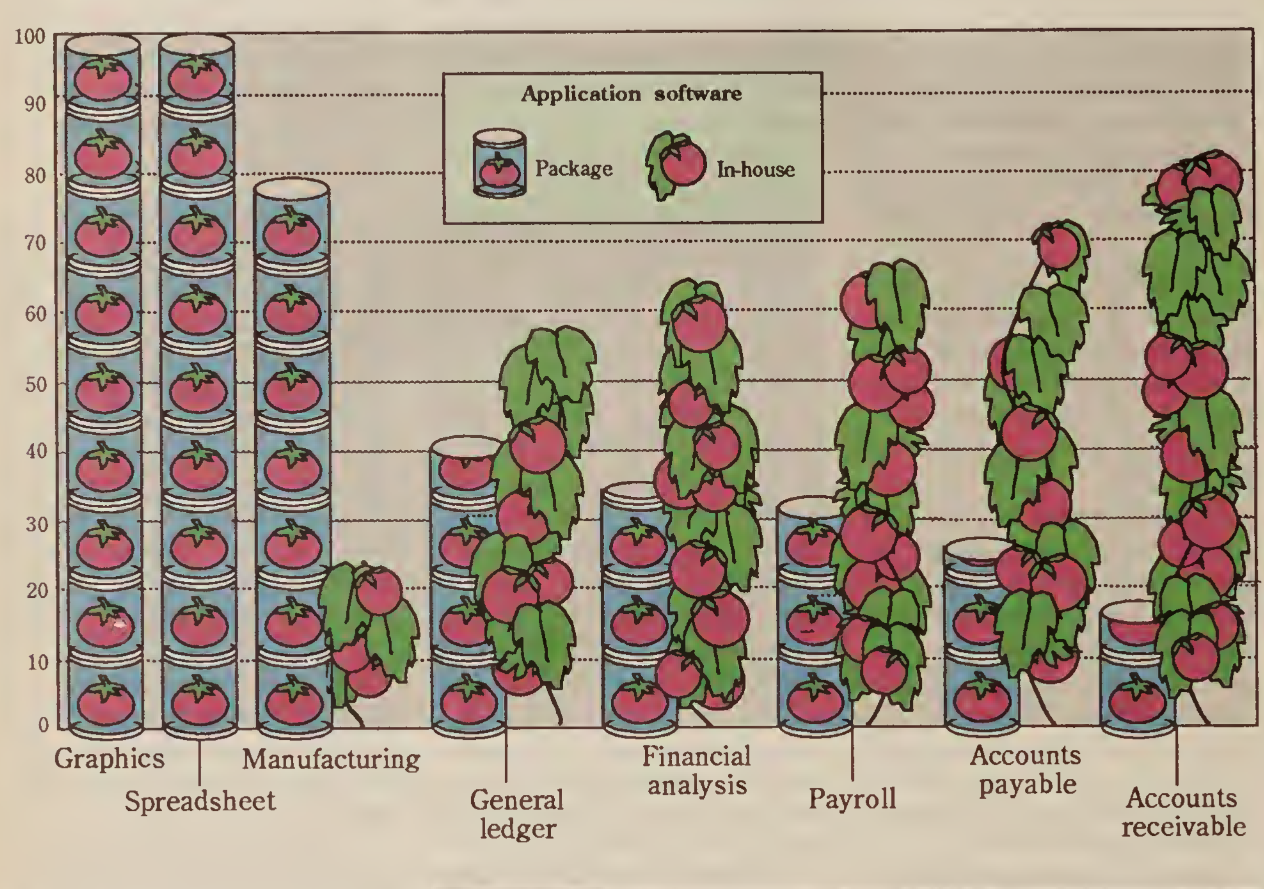
TRENDS

Application software

Newer applications come in packages

PERCENT OF SITES WITH INSTALLED PRODUCT GROUP, IBM U.S. MAINFRAME MARKET



Mainframe users have always had the option of developing programs in-house rather than buying packages from outside vendors. To a surprising degree, some of the most widely used applications stem from an internal development effort.

Data collected from 11,241 IBM mainframe or plug-compatible sites and analyzed by Computer Intelligence, a La Jolla, Calif., market research firm, shows that 82% of all accounts receivable systems, 72% of all accounts payable systems, 71% of all fixed-asset systems and 67% of both payroll and personnel applications were developed in-house rather than purchased from a third-party vendor.

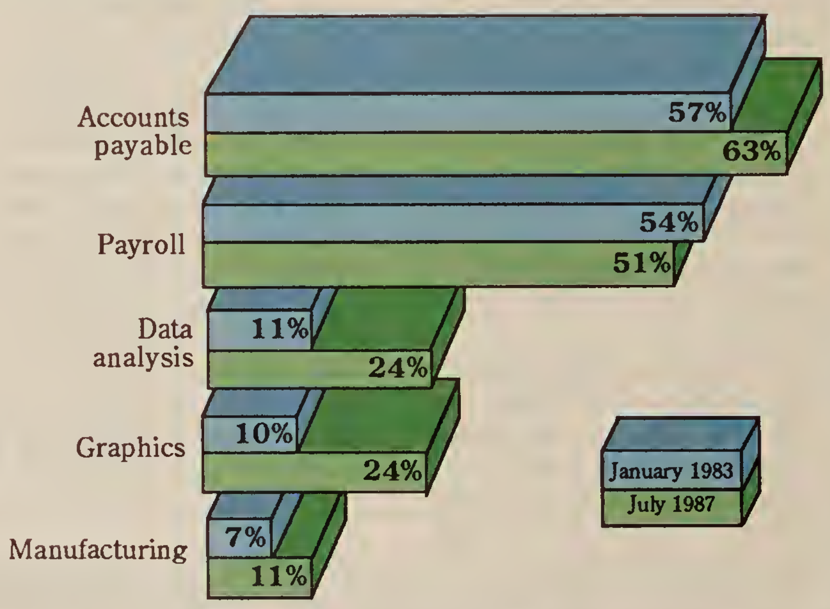
Compared with a year ago, packaged software is making slow headway against the practice of using in-house systems. The percentages, which reflect use as of July 1987, have dropped 3% to 4% since the year-earlier period, with the exception of financial analysis, which stayed even at 64%.

Overall, the use of popular applications is growing broader as such items as graphics programs, spreadsheets and accounts payable have grown by 6% to 14%. Other applications show smaller gains, with the exception of payroll, which may be shrinking as its functions are rolled into human resource applications.

CHARLES BABCOCK

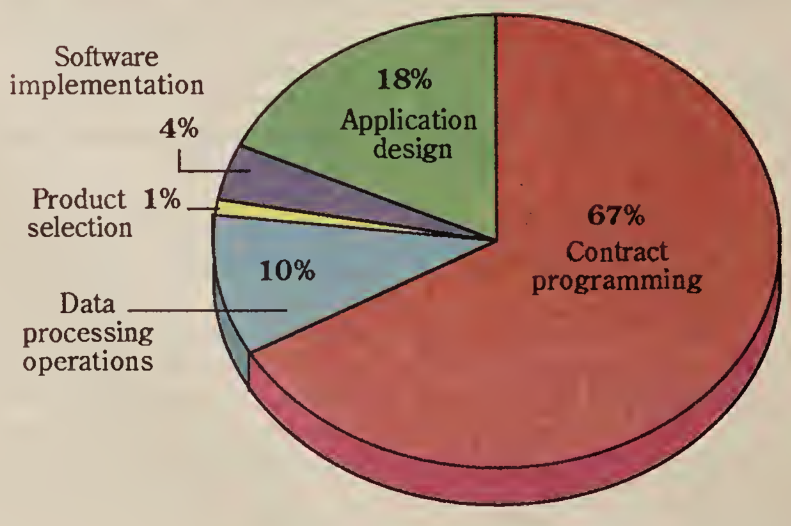
Analysis tools catch on

PERCENT OF SITES USING SELECTED APPLICATIONS, IBM MAINFRAME MARKET



Programmers find plenty of work

TYPES OF CONSULTING USED AT IBM MAINFRAME SITES



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHARTS: AMY J. SWANSON

INSIDE LINES

Serving up tidbits. With the Microsoft/Ashton-Tate announcement last week, rumors about what counterpunches Lotus might throw have already started. One source says some Lotus folks were in to see Relational Technology last week, possibly talking about a deal to hook Lotus DBMS to Ingres. And this may not be the only option Lotus could counterattack with. Arity Corp., which Lotus has a stake in, markets an SQL engine, along with some expert systems. That combination might make for an interesting, if not competitive, mix of products against the Microsoft/Ashton-Tate SQL Server.

Stratification. Stratus plans to unveil two systems in its line of fault-tolerant processors tomorrow. The minicomputers are expected to be entry-level machines with a base price starting at less than $100,000, according to a source close to the company. The machines will reportedly have processing power similar to that of current low-end XA2000 models but will have fewer communications ports, thus saving users money on communications controllers.

They keep talking. IBM will offer a version of its RT PC in 1992 or 1993 that will be capable of 100 MIPS, according to Bob Williams, vice-president and general manager of computer-integrated manufacturing systems in IBM's Application Systems Division. Williams' comment came at a recent meeting of IBM users, according to an attendee. Meanwhile, a reliable source tells us that IBM has signed an agreement with Relational Technology to run Ingres under its AIX operating system for the PS/2 Model 80 and RT PC machines. Our source notes that the agreement is another move by IBM to convey its seriousness about Unix to the U.S. government.

Not necessarily the news. In a bizarre chapter in the history of corporate press relations, IBM mainframe peripherals vendor Cambex Corp. in Waltham, Mass., issued a press release earlier this month saying, "Cambex sues EMC for theft of trade secrets." The statement was true — but the suit was filed June 17, 1987. Hopkinton, Mass.-based EMC Corp. promptly fired off a press release of its own, blasting Cambex for misleading information and the "misuse of acceptable news procedures." Cambex President Joseph Kruy says Cambex issued the release because the company intends to renew its previously denied motion for a restraining order. Cambex's counsel is Thomas Christo, who won well-publicized computer user suits against vendors several years ago. Stay tuned.

Waiting for Mr. Goodvibes. IBM may well have had an excellent fourth quarter, if the performance of computer leasing companies during the same period is any indication. Leasing firms had a banner quarter and year, according to Richard Forsythe, president of Forsythe McArthur Associates, Inc. in Skokie, Ill. Historically, the performance of leasing companies has mirrored that of IBM, says Rick Martin, an analyst at Sanford C. Bernstein. IBM has remained mum but is not cautioning anyone to lower expectations, which it has often done prior to down quarters, Martin says.

We read it in the want ads. Data General has been advertising for engineers with IBM connectivity experience, particularly in Netview/PC and OS/2. The company wants communications experts to help define and design its IBM connectivity strategy, says Joseph Forgione, DG director of communications product marketing. DG has a "stated commitment" to support Netview, IBM's network management system, Forgione says, but needs expert help to define the nature of that support. DG is also working on ways to connect OS/2-based products to its hosts and Xodiac network, according to Forgione. Support for Microsoft's LAN Manager is one likely route for DG, he says. Also wanted are senior software engineers to design the next generation of DG's network management system, which must be able to handle large, distributed networks, Forgione says.

Like shooting a sitting DEC. Pundits had a field day with reports last week that DEC's Microvax 3000 family is missing its delivery schedule. One observer suggested a new DEC motto: "Digital has it soon."

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